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USSR Report

SCIENCE AND TECHNOLOGY POLICY

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30 SEPTEMBER 1986

USSR REPORT

SCIENCE AND TECHNOLOGY POLICY

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ORGANIZATION, PLANNING AND COORDINATION

WORK ON MINOR THEMES REDUCES RETURN OF SCIENTIFIC INSTITUTES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 10 Jul 86 p 1

[Article by Ye. Leontyeva, deputy editor of SOTSIALISTICHESKAYA INDUSTRIYA for the Science and Technical Progress Department, under the rubric "Sectorial Science: Means of Reorganization": "Work on Minor Themes"; first paragraph is SOTSIALISTICHESKAYA INDUSTRIYA introduction]

[Text] If you put on one pan of a scales the staff of the army of scientists and on the other their research, works, and developments, the latter, I dare say, will be a little larger in volume. But here is the paradox: it is tightly filled, but all the same soars upward easily. In some laboratories there are up to 20 themes—an unthinkable number—per staff member a year, and their weight is infinitesimally small. Work on minor themes....

This problem worries many people. Evidence of this is the responses to our publications under the rubric "Sectorial Sciences: Means of Reorganization." Judging from them, it can be safely said: this is no longer simply a problem, of which there are many in the national economy, but a phenomenon. A negative, firmly rooted one. It has spread and crept through scientific institutions and filled institutes and design bureaus. It is crowding profound, main developments.

In the recently adopted decree of the USSR Council of Ministers "On Serious Shortcomings in the Activity of Several Scientific Research and Planning and Design Organizations" it is stated that at times their work is not of a creative nature and does not have an appreciable influence on the increase of the technical level of production. Work on minor themes is one of the serious causes of this.

Having examined the indicators of the development of sectorial science during the past five-year plan, without particular difficulty we will note: the number of themes at the institutes of many ministries steadily increases from year to year. I will cite the example of the large scientific institution called the VNIKitsvetmetavtomatika. In the USSR Ministry of Nonferrous Metallurgy it is possible to call it the record holder in work on minor themes. The 4 million rubles invested in it annually account for 280 themes. To what is this leading? Here is what.

When a design artist writes with a dauntless hand on a poster "The Achievements of Science Into Life," it is not worth believing it 100 percent. No, far from all achievements are worthy of a start in life. The main task of the institute I named is the automation of production processes in the sector. But new shops and entire plants come on line and are often begin to operate not in an automated mode, as was proposed according to the plan, but in the old way, with a large number of manual operations or auxiliary means of mechanization. The new works need for this thousands of extra hands--again contrary to the plans. Means of automation poorly, very poorly make friends with advanced technologies; they become acclimatized slowly at enterprises. But minor, immediate, far from the most important developments more actively break through here.

And the scientists of the institute are finding justification for the fact that they are poorly managing their main direction: this is no time, they say, we are loaded up over our heads. But loaded up with what? Why, with this same abundance of 1-day themes. Is it possible that each of them is so important that it is impossible to forego a single one? Not likely! Any scientific institution is established in order to pursue consistently and effectively one, well, two global directions, but in no way close to 300.

Scrub forest, low water, work on minor themes.... For some reason these words seem related to me and form up into a kind of synonymic series. If mighty fir trees or spreading hardy oak trees are cut down, a change of species will occur. Greedy young growth of little worth, which will itself begin to choke itself, will quickly seize the territory. Having been exchanged for weedy vegetation, the once good forest quickly loses its might. Low water is also dangerous for the same thing. It is not enough that a large ship cannot run here. Low, warm waters are conducive to stagnation and choking with weeds and are liable to bog formation. Here it is one step from work on minor scientific themes to degeneracy.

Is that not what happened with the VNIikompozit of the Ministry of the Chemical Industry? Its yield today is 4 kopecks per ruble of expenditures. It is not an institute, but an inactive freak with an enormous mouth. The pittance of its scientific "good" are something like a tip to the state. And, what is interesting, this institution itself does not feel such. I was able to trace its entire path in life from origination to the present inglorious results. It was established 7 years ago with great pomp (not some design bureau, but give without fail an institute of union importance, the ministry demanded) and with great pretensions (only it will be able to carry out the development and organize the production of filled polymers, which the country needs very much).

No, the new fledged institute did not move its detachments onto the main road. Its basic forces immediately strayed into the quagmire of trifles. But does someone, perhaps, need these minor problems, which are far from the task posed for the institute? Indeed, it is difficult to answer convincingly. The collective set to work on 1 theme, spent 100,000 rubles--it turned out to be in vain. It assigned a number of themes on a contractual basis to other organizations, but here, too, there is a "puncture." It assigned them in an ill-considered, groundless manner, therefore, the majority of them were

completed in vain or the need for them disappeared already before the expiration of the term of the contract. Does such a scientific subdivision have the right to existence, that is the question?

I will venture to say that a certain type of scientist of narrow-minded ways, who prefers to keep a little farther from serious matters and a little closer to peaceful existence, even formed in this manner. One who does not want and does not know how to take risks, to dare, to hurt himself. A person with such a psychology will not develop a new machine—he will partially improve an old one. He will unhurriedly take trouble with local problems. He will not rise above minor, immediate concerns.

He is sharply discordant with the enormous tasks which face our economy. The times are categorical: it is necessary to increase not by percent, but by orders of 10. The times require revolutionary steps in equipment and technology.

But who, if not science, is to begin them? The reorganization, the radical renovation of production became urgent long ago. And it has begun, but for the present still to the extent to which it can be reorganized on its own basis, on the available "reserve" and manpower, material, and financial reserves. It is possible to raise the deep formations only on the basis of the latest achievements of science. But this means that it should itself be reorganized twofold, threefold more rapidly than production.

But how, for example, is the VNIPIvtorchmet being reorganized. The metal stock of our country is enormous--about 6 billion tons of metal are "incorporated" in structures and machine tools, in operating equipment, and at the dump. In addition to this millions of tons are smelted annually. Hence it is easy to imagine what a colossal amount of it awaits rebirth. But you do not throw a rusted machine any old way into the furnace: it is necessary to prepare it for processing. You ask, are they developing at this institute highly efficient methods of preparing scrap, which make it possible to increase labor productivity sharply at secondary ferrous metal enterprises? Of course, we are developing them, they will reply to you not without pride. They will name crushing by the method of cooling—it is well known that in case of deep cooling metal becomes brittle like glass; the explosion separation of metal—it is possible by means of it to "be done" quickly, for example, with a ship; and hot faggotting. What will you say to this? Just one thing: all these methods have been operating for a long time and efficiently...at many foreign firms. Our scientists have just begun to move in their footsteps. In any case, at present there is no outlet into industry. There is nothing to say about leading developments. But there are loads of trifles.

A quite interesting common feature is visible in how scientific research is organized at all three of the named institutes. Nearly every department here stews in its own juices and lives by its own standards which are convenient for it. In practice the performers themselves propose and plan the themes, research, and development. They conclude themselves the most advantageous contracts for them with enterprises. And even though for the sector the theme is extremely important and is very necessary, they will reject it extremely

calmly merely on the basis that the department has already taken on the necessary amount of contractual operations, having found common ground with the most advantageous, compliant partners. The adopted system of reporting and the stimulation of developers also incites them to this. It is clear that such a system poorly fits the vital national economic tasks.

Who is to limit the dictates of the performer, who is himself the person who gives himself orders? As a rule, there is no superdepartmental and especially no superinstitute organizing center which is capable of uniting the separate groups and of forcing them to work in the main directions, without dispersing forces among trifles. And still there is an antidote to work on minor themes. It is the efficient organization of the management of scientific and technical progress.

The all-union associations and administrations of ministries, under whose subordination the sectorial institutes are, often do not cope with this task. Moreover, they themselves impose on scientific research institutes a large number of current assignments, which are far from the real tasks of science, and minor immediate themes, which should be fulfilled by institutes of the general type--on the scientific organization of labor, the study of the turnover of personnel, economics, sociology, standardization, information, and so on. You look, and the scientific institution has turned into an office appendage of the superior organization.

I do not mean to say that scientific deterioration is a universal trend and that candidates and doctors, who have devoted themselves to egotistical dissertation interests, have no one from whom to take an example. Fundamentally new, unprecedented ideas, solutions, and inventions are shooting out in mighty streams from under the ice sheet of organizational and management stagnation, psychological routine, and the incoherence of evaluation criteria. Advanced laser, plasma, and ultrasonic technologies are already operating, pulse loads and ultrahigh pressures are being used in production processes.

The examples of work on minor themes were taken by me in three ministries--the Ministry of Ferrous Metallurgy, the Ministry of Nonferrous Metallurgy, and the Ministry of the Chemical Industry. But here along with the named institutes there are others--ones which are making a substantial contribution to scientific and technical progress. For example, the All-Union Scientific Research Institute of Synthetic Resins has created an enormous reserve for the development of membrane technologies. While new methods of the direct production of steel and promising means of processing metal outside the furnace come from the Central Scientific Research Institute of Ferrous Metallurgy.

It is safe to say about these collectives that they did not waste time on the "hammering" of an impact out of "odd jobs" and did not think about cheap prestige, but, having concentrated efforts in the main directions, persistently took their own course. Having displayed genuine economic independence, they were able to find means of stimulating promising ideas and were able to rise above departmentalism and to create interdepartmental developments of a world level.

I would not say that their path into industry is easy and simple. On the contrary, it is thorny and difficult, since it depends not only on the potentials of the given collective of scientists, but also on the functioning of the entire economic mechanism. But it, as we know, is far from perfect. For this reason it will not be that easy to get rid of work or minor themes. But it is extremely necessary.

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FORECASTING IN NATIONAL ECONOMIC MANAGEMENT

Moscow PROGNOZ V UPRAVLENII (NOVOYE V ZHIZNI, NAUKE, TEKHNIKE: SERIYA "NAUKA I TEKHNIKA UPRAVLENIYA", No 11) in Russian 1985 (signed to press 15 Oct 85) pp 2-6

[Table of contents, annotation, introduction, and first section from book "The Forecast in Management," by Candidate of Economic Sciences Vladimir Viktorovich Grigoryev, Izdatelstvo "Znaniye", 25,560 copies, 64 pages]

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Annotation

In the pamphlet the basic principles and methods of socioeconomic forecasting are examined, the stages of the elaboration of forecasts are presented, and the experience of forecasting in the practice of the management of the national economy is cited. Particular attention is devoted to the classification of forecasts, as well as to the use of mathematical economic

modeling of the activity of industrial enterprises in case of the elaboration of forecasts.

The pamphlet is intended for lecturers, economic managers of various levels, and students of people's universities and the network of economic education.

The economist should always look ahead, in the direction of the progress of technology, otherwise he will immediately find himself behind. (V.I. Lenin)

Introduction

The term "forecasting" received especially extensive dissemination in the 1960's, when the special theory of the elaboration of forecasts of controllable phenomena began to be formed. Forecasting actually has a lengthy history. The general methodological foundations of forecasting were laid in the works of K. Marx, F. Engels, and V.I. Lenin. An active practical push in this respect was given by the experience of national economic planning in the USSR in the 1920's and early 1930's, when the need for preplanning forecasting elaborations appeared. Thus, starting with the plan of the State Commission for the Electrification of Russia, specific scientific analytical work, which was of a forecasting nature, preceded all the long-range plans which were drafted in our country.

Forecasting as one of the forms of the specification of scientific foresight in the socioeconomic area is interconnected with planning, programming, designing, and management. This appears in parallel forecast-plan and forecast-design developments and so forth (goal, planning, design, program, and organizational forecasting).

In recent times forecasting has become a more and more necessary condition of the optimum functioning of the national economy. In the complicated process of long-range planning forecasting performs the function of the prediction of the means of the socioeconomic development of social production and the scientific substantiation of its goals.

The practice of substantiating long-term, five-year, and annual plans of the development of the national economy on the basis of forecasting studies has formed in the Soviet Union. Both the highest levels of the management of the national economy and (in connection with the complication of production processes, the increase of the scale of production, and the increase of the independence of individual units) the lower levels--enterprises and associations--serve as the object of these studies. The need for the implementation of the continuous process of forecasting, in order to increase the effectiveness of the management decisions being made, appears at precisely these levels of management. Under production conditions such management functions as planning, organization, and monitoring are implemented more effectively by means of forecasts.

In this connection in the offered pamphlet we will examine the role of forecasting in the management of production, the principles of economic forecasting, and the basic provisions of the systems approach to this process. Significant space in the work is devoted to the generalization of the

experience of forecasting in the sectors of the national economy and to the effectiveness of economic forecasts.

The Forecast and the Management of Production

In the decree of the September (1965) CPSU Central Committee Plenum "On the Improvement of the Management of Industry, the Improvement of Planning, and the Strengthening of the Economic Stimulation of Industrial Production" it is specified that the national economic plans should take into account the prospects of scientific and technical progress, envisage a rapid pace of the introduction and assimilation of the achievements of science and technology, and be based on realistic and objective calculations.

In the 1970's the theoretical research on the elaboration of methods of the forecasting of socioeconomic, scientific, and technical development received further progress. The elaboration of forecasts is a statewide task and is included as an important direction in the measures on the improvement of the management of production. In the Accountability Report of the CPSU Central Committee to the 25th Party Congress it was noted: "On the instructions of the CPSU Central Committee and the government academic institutes jointly with ministries and departments prepared a draft of the Comprehensive Program of Scientific and Technical Progress and Its Socioeconomic Consequences for 1986-1990. It is necessary to continue the work on this program—it constitutes a fundamental part of current long-range planning, it gives guidelines, without the knowledge of which it is impossible to manage the economy successfully." (Footnote 1) ("Materialy XXV syezda KPSS" [Materials of the 25th CPSU Congress], Moscow, Politizdat, 1976, p 48) At the 26th CPSU Congress this program underwent further development. At present the elaboration of the same kind of program to 2005 is being carried out.

The elaboration of forecasts precedes the drawing up of all national economic plans, it is called upon to provide the best prerequisites for the making of management decisions.

Forecasting is playing a large role not only at the national economic level of management. It is also of no less importance for the strategic management of sectors and enterprises. The point is that frequently the management of production reduces to a reaction to a negative change in it. With the introduction into the practice of management of the system of the forecasting of the activity of the enterprise its management can foresee more clearly these changes or prevent them, as well as consciously plan positive changes. Thereby the foreseeing of events makes it possible to prepare in good time for them, to take into account their positive and negative consequences, and, if this is possible, to intervene in the course of events and to control them.

Forecasting not only is a tool of the increase of the scientific level of planning, but also has an active influence on all other types of management activity—organization, regulation, monitoring.

Long-term, intermediate-term, and short-term forecasting is used in the process of managing production. The elaboration of a long-term forecast is carried out, as a rule, at the preplanning stage, and it is the basis of the

long-range planning of the activity of the organization. Long-term forecasting envisages the choice of strategic alternatives of the development of the enterprise, the consequences of which show up over a long time. Short-term forecasting is carried out in the process of the current and operational management of production. Thus, it is possible to define conditionally the time horizons of economic forecasting: for the short-term forecast--up to 5 years, for the long-term forecast--over 5 years. In case of [end of available text].

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FACILITIES AND MANPOWER

CLOSING OF INEFFICIENT SECTORIAL RESEARCH ORGANIZATIONS

Moscow IZVESTIYA in Russian 22, 23 Jul 86

[Article by IZVESTIYA science commentator B. Konovalov under the rubric "Management: The Style and the Result"]

[22 Jul 86 p 2]

[Text] "Why They Are Closing Institutes"

Recently the USSR Council of Ministers adopted the decree "On Serious Shortcomings in the Activity of Several Sectorial Scientific Research and Planning and Design Organizations." It is noted in it that their work is inefficient and does not have an appreciable influence on the increase of the technical level of production.

The check of the institutes, which preceded this and was conducted by the USSR Committee of People's Control and the USSR State Committee for Science and Technology (GKNT), revealed an extremely alarming trend in the development of sectorial science--the fruitlessness of many developments, including those which are being carried out on important and topical themes.

For example, in the State Committee for Hydrometeorology and Environmental Control the system of ground meteorological measurements and observations has changed little in recent decades. The instruments, with which it is equipped, as a rule, do not make it possible to automate operations and require constant maintenance. At the stations and posts of the hydrometeorological service tens of thousands of people are engaged in this. At the same time, in essence, the development by the Scientific Research Institute of Instrument Making of the State Committee for Hydrometeorological and Environmental Control of an automatic unattended hydrometeorological station proved to be worthless. In 2 years not one of the four such stations, which were sent to Kazakhstan for tests, ever functioned as a complete unit. The fog sensors did not work from the very start. The instruments, which record atmospheric pressure, rusted and broke down during the 1st year of operation, the temperature and humidity sensors regularly gave distorted information, while the recorders of sunshine showed the presence of the sun even at night. All four expensive stations were written off. And this is not an isolated phenomenon. During the 9th and

10th Five-Year Plans not 1 of the 29 developments of the institute went into large-series production.

A no less dangerous disease of sectorial science is work on minor themes and a low scientific level of research. Thus, the Dzhzhkzgan Scientific Research, Planning, and Design Institute of Nonferrous Metallurgy of the Kazakh SSR Ministry of Nonferrous Metallurgy, which has existed since 1970, so far has not produced one development which has found use within the Dzhzhkzgan Mining and Metallurgical Combine. The institute in practice has no influence on the technical level of other enterprises. Simply an enormous plant laboratory, which is working on special production problems, actually exists at the expense of budget allocations which are intended for in-depth research. And this as a whole is characteristic of sectorial science. The number of institutes is increasing and is being maintained by means of budget allocations, often not vital tasks, but minor ones, which should be performed on a cost accounting basis, are being accomplished.

We have a developed network of sectorial scientific research institutes and design bureaus. But, unfortunately, we are often forced to purchase foreign technologies and equipment. With respect to many positions the products of our industry lag behind the world level. For example, in such a key sector for all machine building as machine tool building only 14 percent of the products conform to the world level. And, of course, a large share of the responsibility for this rests with sectorial science.

Attaching especially great importance to the state of affairs in machine building, the Council of Ministers agreed to an extraordinary measure: a decision was made on the elimination of two institutes of the machine building type--the GipronImash [State Scientific Research and Design Institute of Machine Building] of the Ministry of the Machine Tool and Tool Building Industry and the VNIImplekt [All-Union Scientific Research, Planning and Design Institute for Unitized Production Lines] of the Ministry of Chemical and Petroleum Machine Building.

This is an object lesson and a serious warning to all organizations of sectorial science. If they do not reorganize their work in conformity with the decisions of the 27th CPSU Congress, very strict steps may be taken.

The state of affairs in the sector under their care should now become the main criterion of the evaluation of their activity. While the best world examples should become the "gauge" for the technical level of our industry and the output being produced. Today the work of sectorial institutes cannot be considered good, if matters in the industry under their care are going poorly.

It is instructive to look from precisely this standpoint at the activity of the eliminated GipronImash of the Ministry of the Machine Tool and Tool Building Industry--the main organization in the country for questions of the comprehensive development of the industry of general machine building application. It was established 9 years ago, when it was decided to develop the production of products used in general machine building mainly in the Ministry of the Machine Tool and Tool Building Industry.

The logic was simple: the sector produces machine tools for all machine building, hence, it can also supply for everyone blanks, widely used assemblies, and parts. The specialization of such production and the standardization of items would make it possible to organize the mass production of large series at highly automated plants, to ensure a high labor productivity, and to decrease sharply the cost of products.

In the Ministry of the Machine Tool and Tool Building Industry they organized the special Administration for the Coordination of the Manufacture of Products Used in General Machine Building. The GiproNIImash was also subordinated to it for the development of advanced technologies and the pursuit of a unified technical policy in all 11 machine building ministries.

Now it must be admitted that this attempt at the establishment of an intersectorial industry within a sectorial ministry was not crowned with success. Although it was approved by a separate line in the national economic plans, all the same it was aimed first of all at meeting the needs of the Ministry of the Machine Tool and Tool Building Industry itself. Other ministries were forced, without relying on cooperation, to establish "subsistence economies" and to organize their own production. Thus, of the 24 Tsentrólits now in operation in the country, only 10 belong to the Ministry of the Machine Tool and Tool Building Industry.

Effective forms of the pursuit of a unified technical policy in the machine building ministries were also not found. According to the data of the USSR State Planning Committee, for example, about 1,200 plants produce gears for machine building, while the number of their type sizes has reached 80,000. In all 40 institutes and design bureaus, as well as 25 higher educational institutions design hydraulic equipment.

That is, the central tasks, which were posed by the USSR Council of Ministers in 1977 for the GiproNIImash, which was being established, were not fulfilled. It was not able to become either the coordinating center in the implementation of the unified technical policy or the developer of advanced technologies for enterprises which produce general machine building products. The Ministry of the Machine Tool and Tool Building Industry gradually turned this main institute in practice into a purely design institute.

Design operations made up 70 percent of the total amount of activity of the institute. But the main thing is that its scientific research section, in essence, degenerated. The critical analysis of the 1986 thematic plan showed that of the 45 scientific themes of the GiproNIImash it is possible to single out only 4 as promising, potentially patentable ones. The rest are special problems of enterprises and organizations of the Ministry of the Machine Tool and Tool Building Industry.

On the basis of the research work conducted at the GiproNIImash itself not one candidate dissertation was defended throughout its history. All eight candidates of sciences of the 595 staff members of the institute were attracted "from outside." In the 9 years of the existence of the institute only two inventions appeared.

There were not enough developments of the scientists to keep the pilot experimental plant of the institute in Kaluga completely busy. Last year, for example, the plan of its production came to only 60 percent of the real capacity of the plant in case of operation during one shift.

As just as dreary overall situation also formed at the other main organization which was eliminated by the USSR Council of Ministers--the All-Union Scientific Research, Planning, and Design Institute for Unitized Production Lines (VNIikomplekt) of the Ministry of Chemical and Petroleum Machine Building. Let us note at once, in order to eliminate false rumors, that this does not mean the condemnation of the very idea of the need for the delivery of complete sets of production equipment to clients. On the contrary, in March 1986 the recently established Bureau of the USSR Council of Ministers for Machine Building ordered all machine building ministries to change over to the delivery of complete sets of technological systems. And no one rescinded this decision. But, as is known, it is possible to discredit a fine idea in the process of its implementation.

The VNIikomplekt instead research work engaged mainly in organizational work, having simply turned into an "appendage" of the Main Administration for Deliveries of Complete Technological Lines, Plants, and Units of the Ministry of Chemical and Petroleum Machine Building, to which it was subordinate. The check made by the USSR Committee of People's Control showed that the VNIikomplekt in essence did not fulfill the functions of either a scientific research or a planning and design organization. At the institute, which was established in 1974, of the 110-130 themes elaborated annually only a handful pertained to operations of a scientific research nature. Thus, in 1985 of the 120 assignments of the thematic plan it is possible to call only 5 research operations.

In the remuneration of labor the first category was granted to the institute. At the VNIikomplekt 15 departments were established, 7 chief designers for problems and 22 chief project designers were appointed. As a whole there turned out to be 176 managers of different levels for the 71 rank and file staff members. Moreover, for example, a "woman scientist" with a pedagogical education, who did not have a scientific degree, held the position of senior scientific associate.

And, for the most part, these highly paid staff members engaged in the concluding of contracts with clients for the development and delivery of production lines, the enlistment of other organizations in their designing, the financing of the operations, and the coordination of the technical specifications.

So that in appearance the activity of the institute would look "impressive," the state statistical returns were distorted. In 1985, for example, the VNIikomplekt reported on the introduction in production of the results of developments with respect to 57 themes, while in fact only 7 of them were found.

The outcome was natural. It is now necessary to provide with jobs all the staff members of the VNIikomplekt and the Gipronimash. Following the decree

of the USSR Council of Ministers many officials were strictly punished. And the directors of the eliminate institutes were punished most strictly of all. L.N. Bronnikov, former director of the GipronImash, who in May 1986 was promoted by the Ministry of the Machine Tool and Tool Building Industry to a management job in the Ministry, was dismissed from the held position. A strict reprimand was given to I.V. Ilgisonis--the former director of the VNIImplekt. They were also punished along party lines.

All institutes of the country can draw conclusions. First of all they are responsible for the assigned job. And first of all they must themselves establish order in "their own house."

But at the same time the question of the effectiveness of the existing system of the monitoring of the activity of scientific institutions is also becoming urgent. I will speak about this in the next issue of IZVESTIYA.

[23 Jul 86 p 2]

[Text] "Entrust, But Check"

No management system can function without effective monitoring. Meanwhile many of our ministries in fact are not engaging in a critical analysis of the work of the scientific and technical institutions subordinate to them. The departmental evaluation of their activity should be carried out no less often than once every 3 years. But, for example, the Collegium of the Ministry of the Machine Tool and Tool Building Industry in the 9 years of the existence of the GipronImash, which was eliminated by the USSR Council of Ministers, did not examine once the comprehensive report of the institute, only individual fragments of its activity were touched upon.

For long years the Ministry of Chemical and Petroleum Machine Building also put up with the now eliminated VNIImplekt. Moreover, the immediate superior ministerial organization, the Main Administration for Deliveries of Complete Technological Lines, Plants, and Units, shamelessly exploited the VNIImplekt. The main administration of the ministry is a cost accounting administration, and a comparatively small number of people--80--worked there. But in fact hundreds of staff members of the budget-carried VNIImplekt also performed the functions of the cost accounting Main Administration for Deliveries of Complete Technological Lines, Plants, and Units. Unfortunately, this is not an isolated phenomenon. The staff of ministries often throws its work onto the shoulders of subordinate institutes.

The sharp criticism of the USSR Council of Ministers forced the ministry "to rouse itself." In the Ministry of the Machine Tool and Tool Building Industry the management of all the main administrations and production and scientific production associations is now being ordered to analyze carefully the results of the activity of sectorial scientific research and planning and design organizations. But...it was proposed to submit the data on the results of the conducted analysis and measure by 1 October 1986. The Collegium of the Ministry of the Machine Tool and Tool Building Minister so far has not actively joined in the reorganization of sectorial science, although back in February at the party congress it was directly indicated that the main thing,

on which ministry should concentrate their activity under present conditions, is the determination of the strategy of scientific and technical progress in their sector.

The Ministry of Chemical and Petroleum Machine Building proved to be more efficient. Here at the same time as the order on the elimination of the VNIikomplekt a schedule of the comprehensive check of the scientific and technical activity of the organizations of the Ministry of Chemical and Petroleum Machine Building in 1986 was approved. The activity of two institutions—the main technological organization of the VNIPTIkhimneftemash [All-Union Scientific Research, Planning, and Technological Institute of Chemical and Petroleum Machine Building] and the Special Design Bureau for Drill Bits of the Kuybyshevburmash Production Association—has already been discussed in the Collegium of the Ministry of Chemical and Petroleum Machine Building. The serious reorganization of these institutions has been planned. For example, the VNIPTIkhimneftemash has been ordered to reduce by 300 the number of staff members through inefficiently operating subdivisions. The Ministry of Chemical and Petroleum Machine Building also plans to examine in an exacting manner the work of all other scientific and technical organizations.

It is unquestionable that such demandingness should be characteristic of all ministries and departments. The state allocates to them unified funds for the development of sectorial science and technology. And they bear state responsibility for the use of national assets.

True, life shows that departmental monitoring for the present is far from always efficient. Therefore, the principle "entrust, but check" given the present enormous scope of scientific activity should also be used fully with respect to ministries and departments.

In this matter a special and most important role belongs to the USSR State Committee for Science and Technology (GKNT). In conformity with the Statute on the USSR State Committee for Science and Technology checks of sectorial science by temporary scientific and technical commissions have been made for a long time. In recent times more careful state checking of sectorial institutions has also been carried out. The USSR State Committee for Science and Technology is also making a comprehensive check of the activity of the entire network of sectorial science of one ministry or another. This large amount of work is yielding useful results. But still it must be noted that the checks are frequently of a liberal nature, several procedural questions, including such important ones as the determination of the economic efficiency of the activity of scientific institutions, have not been completely settled. But the main thing is that the criticism is for the most part of a special nature, without being raised to major generalizations, which the state has the right to expect from such an organization as the USSR State Committee for Science and Technology.

It is well known that whoever fights for special problems without the preliminary solution of general ones, inevitably will "come across" at every step these general problems.

Such a general problem, which we all the time "come across," as the personnel and financial problem is of enormous importance for the country. For a present the financing of "signs" and the personnel of scientific institutions without the proper analysis--Are the staff members capable of accomplishing the responsible state tasks assigned to them?--is in essence occurring. People, after all, can do only what their skills permit. Unfortunately, a large portion of the skilled personnel in our country are in the system of the Academy of Sciences and at higher educational institutions of the country, while sectorial science accounts for the "lion's share" of the financing. The interaction between them has been poorly organized.

The check of the USSR State Committee for Science and Technology showed that the Scientific Research and Design Institute of Automated Control Systems of Common Carrier Motor Transport of the RSFSR Ministry of Motor Transport (Kazan) is not coping with the accomplishment of the tasks assigned to it. And one of the main reasons is poor manning with scientists of the highest skills. Here there are only 8 candidates of sciences per 587 staff members and not 1 doctor of sciences. Of course, science is advanced not by "degrees," but they all the same reflect the skill of scientists.

More striking examples are also known to the USSR State Committee for Science and Technology. Thus, when checking the network of scientific institutions of the Ministry of Heavy and Transport Machine Building it was established that at the Scientific Research, Planning, Design, and Technological Institute of the Production Association for Adjustable and Precision Equipment (Kramatorsk) there is only 1 candidate of sciences per 1,540 workers, while at a similar institute of the Sibtyazhmash Production Association (Krasnoyarsk) there is 1 per 1,667 staff members. It is also possible to ask: Are they capable at these institutes of conducting serious and in-depth scientific research?

Kozma Prutkov wrote that "if you read on the cage of an elephant the inscription 'buffalo,' do not believe your eyes." It must not be thought that the USSR State Committee for Science and Technology is blind and does not know that for a significant portion of our scientific institutions research activity is merely camouflage of engineering and organizational operations and they have been forced to resort to this, since such are "the rules of the game." Only is it not time to establish order and to inscribe "elephant" on the cage of an elephant?

Does the country really not need organizations of engineering and technical service? So why should they exist under the sign of scientific institutes? Why are we ignoring world experience?

An enormous sector of industrial services, which are called "engineering" and fundamentally unite design and engineering, construction and installation, start-up, and adjustment operations and organizational activity, has now formed abroad.

Not by chance are ministries drumming up a hook or by crook currency so that foreign firms would build for them a plant, a shop, a section and deliver it "turnkey."

But do we have if only one organization which could work "turnkey" over the entire cycle as foreign firms do?

In our country organizations of this sort exist in "disunited" form and are separated by departmental barriers, and much effort and time are spent on their "joining."

It is time to call a spade a spade and to develop industrial services. This is especially important now, when the mass retooling of the enterprises of all sectors is beginning.

A characteristic feature of the present scientific and technical revolution is the integration of science and production. In our country this trend is expressed by the policy of the establishment in sectors of scientific production associations and by the inclusion in them of many current institutes. But for the present this is being carried out mechanically: the scientific and production subdivisions of scientific production associations are financed and paid bonuses in different ways and in essence live, as before, separately. It is clear that such a means is unpromising.

The Ministry of Chemical and Petroleum Machine Building, which starting with the new year is changing over entirely to self-financing, is now blazing new trails. Under these conditions scientific production associations will live and be developed at the expense of the profits from the output of commodity production. They will decide themselves how much capital they are to spend on science and retooling. They should determine themselves what is more advantageous: Should they keep their own large detachment of scientists or order developments and new equipment from other organizations, academic science, or science of higher educational institutions? Such self-financing should, on the one hand, improve the activity of scientific and technical subdivisions and, on the other, force production workers to use the latest achievements more rapidly.

Control by the ruble and by the end result of work, of course, is much more effective than an administrative control, and it is possible to hope that the use of economic levers will change radically the situation in the complex interrelations of science and production.

We are now also "coming across" such a general question as the solution of intersectorial problems. Interbranch scientific technical complexes in the main directions are now being established in our country. But here the uniting of efforts is being confined to the stage of the development of new equipment. The state also greatly needs intersectorial scientific production associations. The discussion of several proposals is already under way. There are many difficulties here, but it is possible and necessary to overcome them.

I have had occasion more than once to talk with workers of the USSR State Committee for Science and Technology of the most different ranks. Everyone keeps saying in unison: we do not have enough rights. Apparently, this is so.

But, unfortunately, the USSR State Committee for Science and Technology is not exercising completely the rights that it now has. If we return to the basic theme of our conversation--the control of the activity of scientific institutions, in the USSR State Committee for Science and Technology you often hear: but what can we do, we do not have the right to eliminate fruitless scientific organizations--either the ministries themselves or the USSR Council of Ministers should do this.

That is incorrect. These arguments are simply the aspiration to shift a job, which is unpleasant and fraught with complaints, onto the shoulders of others. In the Statute on the USSR State Committee for Science and Technology it is stated that it can "make with the participation of ministries and departments decisions on the closing of inefficient scientific institutions and their subdivisions...." The USSR State Committee for Science and Technology has also been given another right--to halt the financing of research and development, which are unjustifiably duplicated or are not of theoretical and practical importance.

So it is this, it would seem, powerful financial lever that the USSR State Committee for Science and Technology is not using. But you will agree that even the halting of the financing for a month of an organization, which is working inefficiently in any direction, would be a formidable warning for the corresponding ministry or department. So that it is a matter not only of a lack of rights.

At the 27th CPSU Congress it was stated that the USSR State Committee for Science and Technology so far has not found its place in the solution of the new problems in the area of scientific and technical policy and has not reorganized its work in light of the present requirements. This process should be sped up, because very much depends on such a key organization.

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CSO: 1814/240

ACTIVITY OF LITHUANIAN SSR ACADEMY OF SCIENCES IN 1984

Vilnius TRUDY AKADEMII NAUK LITOVSKOY SSR: SERIYA B--KHIMIYA, TEKNIKA, FIZICHESKAYA GEOGRAFIYA in Russian No 4, 1985 pp 88-107

[Article by Y. Samaytis, Ya. Ignatyeva, N. Kharitonova, and V. Petrauskas: "The Activity of the Lithuanian SSR Academy of Sciences in 1984"]

[Text] Structure. In the system of the Order of Friendship of Peoples Lithuanian SSR Academy of Sciences (AN) in 1983 there were 3 departments which united 12 institutes:

—the Physical, Technical, and Mathematical Sciences Department—the Institute of Mathematics and Cybernetics (IMK), the Institute of Physics (IF), the Order of Labor Red Banner Institute of Semiconductor Physics (IFP), and the Institute of Physical and Technical Problems of Energetics (IFIPE),

—the Chemical, Technological, and Biological Sciences Department—the Order of Labor Red Banner Institute of Chemistry and Chemical Technology (IKhKhT), the Institute of Biochemistry (IBkh), the Institute of Botany (IB), and the Institute of Zoology and Parasitology (IZP) (with the Geography Department (OG)),

—the Social Sciences Department—the Institute of Economics (IE), the Institute of Philosophy, Sociology, and Law (IFSP) (with the Center of Scientific Information on the Social Sciences (TsNION)), the Institute of History, and the Institute of the Lithuanian Language and Literature (ILYaL).

On 31 December 1984 there were 161 subdivisions (laboratories, departments, bases, experimental sections, workshops) at the institutes of the Academy of Sciences.

In 1984 five new subdivisions of institutes were established: the Department of Systems Programming (the Institute of Mathematics and Cybernetics), the Laboratory of the Control of Computations (the Institute of Mathematics and Cybernetics), the Experimental Plant of Assemblies of Computerized Instruments and Software (the Institute of Mathematics and Cybernetics), the Laboratory of Nonequilibrium Processes (the Institute of Semiconductor Physics), and the Laboratory of the Identification of Systems (the Institute of Physical and Technical Problems of Energetics).

The Laboratory of Computer Control Devices (the Institute of Physical and Technical Problems of Energetics) was dissolved, the Laboratory of the Introduction and Acclimatization of Plants and the Laboratory of Medicinal Plants were united into the Laboratory of Introduction and Landscaping (the Institute of Botany). The Laboratory of Species Biology and the Laboratory of Ichthyology and Hydrobiology were united into the Laboratory of Ichthyology (the Institute of Zoology and Parasitology).

The Laboratory of the Genetics of Microorganisms and the Mutagenesis of Plants was renamed the Laboratory of Genetics (the Institute of Botany), the Laboratory of Carcinology was renamed the Laboratory of Hydrobiology (the Institute of Zoology and Parasitology), the Department of the Economic Efficiency of Scientific and Technical Progress was renamed the Department of the Comprehensive Program of Scientific and Technical Progress (the Institute of Economics), the Laboratory of Software of Economic Research was renamed the Department of the Automation of Economic Calculations (the Institute of Economics), and the Department of Sociological Problems of Management was renamed the Department of Problems of the Socialist Way of Life (the Institute of Philosophy, Sociology, and Law).

In the system of the Academy of Sciences (attached to the Academy of Sciences or to the Presidium of the Academy of Sciences) there were:

—six institutions—the Central Library of the Academy of Sciences (TsB), the Chair of Foreign Languages and the Chair of Philosophy, the Editorial Board of the journal TRUDY AKADEMII NAUK LITOVSKOY SSR, (Footnote 1) (1984 was the 30th anniversary of the publication of the journal TRUDY AKADEMII NAUK LITOVSKOY SSR. See more extensively on the publication of the journal: V. Petrauskas, S. Skyabene, and O. Balkyavichene, "The 30th Anniversary of the Journal TRUDY AKADEMII NAUK LITOVSKOY SSR," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 1(89), 1985, pp 145-146) the Central Archive, and the House of Scientists,

--13 councils—the Republic Council for the Coordination of Scientific Activity in the Natural and Social Sciences, the Editing and Publishing Council, the Council for Terminology, the Council for the Automation of Scientific Research, the Council for Scientific and Technical Information, the Patent and License Council, the Council of Philosophical (Methodological) Seminars, the Council for Applied Problems, the Republic [of the Academy of Sciences and the Lithuanian SSR Ministry of Higher and Secondary Specialized Education] Council for the Coordination of Information on the Achievements of Science, the Council of Centers of the Collective Use of Instruments, the Republic [of the Academy of Sciences and the Lithuanian SSR State Planning Committee] Scientific Council for Problems of Scientific, Technical, and Socioeconomic Forecasting, the Republic [of the Lithuanian SSR State Planning Committee and the Academy of Sciences] Council for Economic Problems, and the Public Scientific Methods Council for the Study of Problems of the Improvement of the Organization of Socialist Competition of the Academy of Sciences and the Lithuanian Republic Council of Trade Unions,

—12 commissions—the Commission for Exhibitions, the Commission for Nature Conservation, the Commission for the Development and Introduction of Computer

Technology, the Commission for Scientific Instrument Making, the Commission for Socialist Competition, the Commission for Bonuses for the Development and Introduction of New Equipment, the Commission for the Study of Questions of Agriculture, the Commission for Atomic Energy, the Commission for the Study of Industrial Robots, the Commission for Comprehensive Cooperation Between the Academy of Sciences and the City of Shyaulyay, the Commission for Work With Young People, and the Commission of the Lithuanian Language (the chairman is Doctor of Philological Sciences Yonas Palenis), (Footnote 2) (See "In the Republic Commission of the Lithuanian Language," SOVETSKAYA LITVA, No 49(12362), 25 Feb 84, p 4)

—16 scientific societies (2 republic societies and 14 affiliate departments of all-union societies.

Seven specialized councils for the defense of doctoral and candidate dissertations operated under the institutes of the Academy of Sciences: the Institute of Chemistry and Chemical Technology (doctors of sciences)--the specialties "Electrochemistry" and "Physical Chemistry," the Institute of Biochemistry (candidates of sciences)--the specialties "Biochemistry" and "Cytology," the Institute of Botany (candidates of sciences)--the specialties "Botany" and "Plant Physiology," the Institute of Physical and Technical Problems of Energetics (candidates of sciences)--the specialties "The Theory of Heat Engineering," "Heat and Power Engineering of Industry," and "Thermal Physics," the Institute of History (candidates of sciences)--the specialties "The History of the USSR" and "Archeology," the Institute of Economics (candidates of sciences)--the specialty "The Economics of the National Economy, Management, and Planning," and the Institute of Philosophy, Sociology, and Law (doctors of sciences)--the specialty "The History of Philosophy."

Personnel. On 31 December 1984 there were at the Academy of Sciences 23 full members and 31 corresponding members, including 2 corresponding members of the USSR Academy of Sciences and 1 full member (academician) (at the session of the General Assembly of the USSR Academy of Sciences on 26 December 1984 President of the Lithuanian SSR Academy of Sciences Yu. Pozhela was elected a full member (academician) of the USSR Academy of Sciences in the specialty "The Element Base and Materials of Computer Technology and Diagnostics").

In all 4,956 people, including 1,855 scientific associates (107 doctors of sciences and 924 candidates of sciences), worked at the Academy of Sciences.

On 26 May 1984 Academician Zigmās Yanushkyavichyus died, (Footnote 3) (See "Zigmās Januskevicius (1911-1984)," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 1(89), 1985, pp 105-109) on 7 October 1984 Corresponding Member of the Academy of Sciences Yonas Bulavas died. (Footnote 4) (See "Jonas Bulavas (1903-1984)," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 2(90), 1985, pp 135-137)

In 1984, 9 doctoral dissertations (E. Shpilevskiy (the Institute of Mathematics and Cybernetics), G. Pragarauskas (the Institute of Mathematics and Cybernetics), V. Shneyder (the Institute of Semiconductor Physics), A. Ambrazyavichyus (the Institute of Physical and Technical Problems of

Energetics), M. Tamonis (the Institute of Physical and Technical Problems of Energetics), A. Lugauskas (the Institute of Botany), M. Meshkauskene (the Institute of Economics), A. Gaydis (the Institute of Philosophy, Sociology, and Law), and B. Kuzmitskas (the Institute of Philosophy, Sociology, and Law)) and 58 candidate dissertations were defended.

Table 1

Staff Members of the Lithuanian SSR Academy of Sciences on 31 December 1984

Institution	Total	Sci- entists	Aca- demi- cians	Corre- spond- ing mem- bers	Doc- tors of sci- ences	Candi- dates of sci- ences	Gradu- ate stu- dents
Institute of Mathematics and Cybernetics.....	452	191	1	3	11	92	40
Institute of Physics.....	533	191	2	2	7	80	18
Institute of Semiconduc- tor Physics.....	648	148	-	1	12	81	17
Institute of Physical and Technical Problems of Energetics.....	718	242	-	3	10	91	30
Institute of Chemistry and Chemical Technology..	629	225	1	1	8	146	13
Institute of Biochemistry	253	128	-	4	7	81	12
Institute of Botany.....	380	135	1	-	3	74	32
Institute of Zoology and Parasitology (with the Geography Department)....	368	200	1	1	11	105	31
Institute of Economics...	172	106	2	-	6	50	34
Institute of History.....	111	75	1	2	9	34	10
Institute of Philosophy, Sociology, and Law (with the Center of Scientific Information on the Social Sciences).....	117	102	-	-	5	35	10
Institute of the Lithu- anian Language and Liter- ature.....	112	79	1	2	11	41	6
Central Library of the Academy of Sciences.....	141	1	-	-	-	1	-
Presidium of the Academy of Sciences and its Central Staff.....	130	14	6	1	6	6	-
Transport Department....	91	-	-	-	-	-	-
Experimental base.....	48	-	-	-	-	-	-
Editorial board of jour- nal TRUDY AKADEMII NAUK LITOVSKOY SSR.....	10	-	-	-	-	-	-

[Table continued on following page]

Table 1 (continued)

Institution	Total	Scien- tists	Aca- demi- cians	Corre- spond- ing mem- bers	Doc- tors of sci- ences	Candi- dates of sci- ences	Gradu- ate stu- dents
Chair of Philosophy....	6	5	-	-	1	4	-
Chair of Foreign Languages.....	14	13	-	-	-	3	-
House of Scientists....	23	-	-	-	-	-	-
Total.....	4956	1885	16*	20*	107	924	253

*In all 7 academicians and 11 corresponding members work at other scientific institutions and higher educational institutions of the republic.

On 7 February 1984 Academician V. Statulyavichyus was elected chairman of the Board of the Society for Knowledge of the Lithuanian SSR.

Party Organization. On 31 December 1984 there were at the Academy of Sciences 15 party organizations, in which there were 459 communists.

The following most important questions of ideological, party organizational, and scientific production work were discussed at the 13 meetings of the party committee: the activity of the party organization of the Institute of Botany on the improvement of the work of graduate studies; the role of the party organization of the Institute of Semiconductor Physics in the development of the activity of the Elektronika Scientific Production Complex, the activity of the Komsomol Committee of the Academy of Sciences on the fulfillment of the decrees of the 26th CPSU Congress and the 18th Lithuanian CP Congress; the implementation of the critical comments which were expressed in the speech of First Secretary of the Lithuanian CP Central Committee P. Grishkyavichyus, which was delivered at the meeting to hear reports of the party organization (Footnote 5) (See the speech of First Secretary of the Lithuanian CP Central Committee P. Grishkyavichyus at the meeting of the party organization of the Academy of Sciences on 13 October 1983: "Reports and Elections in Party Organizations. Strengthen the Contact of Science With Production," SOVETSKAYA LITVA, No 236(12249), 14 October 1983, pp 1-2) of the Academy of Sciences, as well as at the meetings of the party organizations of the institutes of the Academy of Sciences; the activity of the party organization of the Institute of Philosophy, Sociology, and Law on the selection and reelection of scientists; on the preparation of a reserve of personnel and the promotion of young people to a supervisory job at the Institute of Biochemistry; the activity of the philosophical methodological seminars at the institutes of the Physical, Technical, and Mathematical Sciences Department; the practical experience of the organization of "Days of Science" in Moletskiy Rayon. The questions of production engineering and public cooperation were discussed jointly with the party committee of the Vilnius Drill Plant.

Komsomol Organization. On 31 December 1984, 14 primary Komsomol organizations, in which there were 697 Komsomol members, were in operation at the Academy of Sciences.

At the 7th Komsomol Conference of the Academy of Sciences, which was held on 29 October 1984, a new Komsomol Committee of the Academy of Sciences was elected: Ya. Olyanovich (the Institute of Chemistry and Chemical Technology), A. Audziyonite (the Presidium of the Academy of Sciences), Y. Vegele (the Institute of Zoology and Parasitology), V. Gaydis (the Institute of Philosophy, Sociology, and Law), S. Gintautas (the Institute of Physics), E. Gudzhinskas (the Institute of Mathematics and Physics), A. Dobravolskas (the Institute of Economics), A. Dyaringis (the Institute of Physics), V. Yelinskas (the Presidium of the Academy of Sciences), S. Lapenis (the Institute of Mathematics and Cybernetics), A. Mitskene (the Presidium of the Academy of Sciences), V. Monkus (the Institute of Mathematics and Cybernetics), S. Pakalnishkis (the Institute of Zoology and Parasitology), Sh. Pilka (the Institute of Botany), K. Pozhela (the Institute of Semiconductor Physics), V. Stanyalyunas (the Institute of Economics), D. Shidlauskayte (the Institute of Chemistry and Chemical Technology), K. Yasyunas (the Institute of Physics), and I. Yatsunskas (the Institute of Economics). Saulius Lapenis was elected secretary of the committee for a second term.

Awards, Prizes. Academician Yu. Matulis was awarded the Order of Friendship of Peoples.

The honorary title of Honored Figure of Science and Technology of the Lithuanian SSR was conferred on Corresponding Member of the Academy of Sciences D. Eydukas. The honorary title of Honored Journalist of the Lithuanian SSR was conferred on Yu. Lautsyus, editor in chief of the journal of the Academy of Sciences MOKSLAS IR TEHNIKA. The honorary title of Honored Worker of Cultural and Educational Work of the Lithuanian SSR was conferred on R. Vyantskyavichyus, scientific secretary of the Editing and Publishing Council.

Honorary diplomas of the Presidium of the Lithuanian SSR Supreme Soviet were awarded to: Sh. Gaylyavichene, chief of a sector of the Central Library; V. Galinis, senior scientific association of the Institute of the Lithuanian Language and Literature; Corresponding Member of the Academy of Sciences A. Prokopchik; K. Yankyavichyus, chief of a laboratory of the Institute of Botany.

For the development and introduction in production of highly efficient technologies of the application of nickel, zinc, conversion, and chrome coatings Academician Yu. Matulis, Academician R. Vishomirskis, director of the Institute of Chemistry and Chemical Technology, and P.-R. Dobrovolskis, A. Bodnevas, M. Mitskus, R. Sharmaytis, Yu. Vegis, A. Petrauskas, and S. Yakobson, associates of the institute, were awarded (together with other scientists and production workers of the republic) the 1984 Prize of the USSR Council of Ministers for the fulfillment of complex scientific research, planning and design, and technological operations in the most important directions of the development of the national economy and its sectors and for

the introduction of the obtained results. (Footnote 6) ("Through Labor There Is Also Honor," SOVETSKAYA LITVA, No 108(12421), 8 May 84, p 3; "The Triumph of Chemists," VECHERNYYE NOVOSTI, No 108(8018), 12 May 1984, p 1; "Mokslo naujovems—'zaliogji gatve'" [Interview su akad. R. Visomirskiu], KAUNO TIESA, No 115(11399), 19 May 1984, p 2; "The Prizes of the USSR Council of Ministers Have Been Presented," SOVETSKAYA LITVA, No 164(12477), 17 July 1984, p 1)

The Lithuanian SSR State Prizes in Science and Technology were awarded to: S. Alishauskas, senior scientific association of the Institute of Physics; A. Ambrazyavichyus, chief of a laboratory of the Institute of Physical and Technical Problems of Energetics; V. Makaryavichyus, deputy director of the Institute of Physical and Technical Problems of Energetics; M. Tamonis, chief of a laboratory of the Institute of Physical and Technical Problems of Energetics; A. Sabalyauskas, senior scientific association of the Institute of the Lithuanian Language and Literature. (Footnote 7) (See "In the Central Committee of the Communist Party of Lithuania and the Lithuanian SSR Council of Ministers. On the Awarding of the 1984 Lithuanian SSR State Prizes in Science, Technology, Literature, and Art," SOVETSKAYA LITVA, No 168(12481), 21 July 1984, pp 1, 3)

The USSR Academy of Sciences awarded Academician V. Kontrimavichyus, Doctor of Medical Sciences S. Bizyulyavichyus, and Candidate of Biological Sciences T. Arnastauskene, members of the collective of the Institute of Zoology and Parasitology, the commemorative medal on the occasion of the 100th anniversary of the birth of Academician Ye. Pavlovskiy for the contribution to the study of the problem of natural focal diseases.

The Academician Prantsishkus Shivitskis Prize for a large contribution to experimental zoology (by Decree No 23 of the Presidium of the Lithuanian SSR Academy of Sciences of 23 April 1984) was awarded to Candidate of Biological Sciences Y. Manyukas (the Institute of Zoology and Parasitology).

The Presidium of the Board of the Society for Knowledge of the Lithuanian SSR awarded the Antanas Snehkus Prize for great services in the matter of the development of the promotion of political and scientific knowledge and the communist education of workers to Academician P. Slavenas.

Sessions of the General Assembly of the Academy of Sciences. The annual report session of the General Assembly of the Academy of Sciences, (Footnote 8) (See V. Petrauskas, S. Skyabene, and O. Balkyavichene, "The Annual Report Session of the General Assembly of the Lithuanian SSR Academy of Sciences (29 February 1984)," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 3(87), 1984, pp 153-160. Also see Y. Samaytis, V. Petrauskas, and V. Redaytis, "The Activity of the Lithuanian SSR Academy of Sciences in 1983," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 2(90), 1985, pp 110-131) at which the report on the activity of the Academy of Sciences in 1983 was discussed and the consolidated plan of scientific research work, which is conducted and coordinated by the Academy of Sciences, for 1984 was approved, was held on 29 February 1984.

An extraordinary session of the General Assembly of the Academy of Sciences, (Footnote 9) (See (ELTA), "Elections at the Lithuanian SSR Academy of

Sciences," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 4(88), 1984, p 156; T. Sidorenko, Y. Samaytis, and V. Petrauskas, "The Extraordinary Session of the General Assembly of the Lithuanian SSR Academy of Sciences (26 June 1984)," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 1(89), 1985, pp 118-127), at which Academician Yuras Pozhela was elected president of the Lithuanian SSR Academy of Sciences, Academician Vitautas Kontrimavichyus was elected academician secretary of the Chemical, Technological, and Biological Sciences Department, Corresponding Member Yonas Matsyavichyus was elected academician secretary of the Social Sciences Department, and V. Kontrimavichyus, who was elected by the department, was approved as director of the Institute of Zoology and Parasitology, was held on 26 June 1984.

Meetings of the Presidium of the Academy of Sciences. There were 64 meetings of the presidium (of them 8 were plenary meetings), at which the following most important questions were discussed:

--the basic directions of the scientific research of the Institute of Economics (Footnote 10) (The Presidium of the Lithuanian SSR Academy of Sciences specified the basic directions of the scientific research of the Institute of Economics by Decree No 324 of 15 October 1984 "On the Basic Direction, Specialization, and Structure of the Institute of Economics" (see Y. Samaytis, "The Basic Scientific Direction, Specialization, and Structure of the Institute of Economics Have Been Specified," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA A, Vol 2(91), 1985, pp 139-141) fulfilling the instructions and tasks, which the Buro of the Lithuanian CP Central Committee posed for the institute when discussing the question of increasing the role of the Institute of Economics in solving the most important problems of the economic development of the republic (see "In the Buro of the Lithuanian CP Central Committee," SOVETSKAYA LITVA, No 149(12462), 29 July 1984, p 1)) and the Institute of Botany; (Footnote 11) (The basic directions of the scientific research of the Institute of Botany were specified by Decree No 6 of the Presidium of the Lithuanian SSR Academy of Sciences of 9 January 1984 "On the Basic Directions of the Scientific Research and the Problems of the Institute of Botany," after the adoption of which the total number of basic directions of scientific research of the Academy of Sciences became 19 (instead of 18, see Footnote 20))

--the formulation of republic comprehensive scientific, technical, and socioeconomic programs for 1986-1990 and the period to 2000;

--the further increase of the economic effectiveness of the introduction of the results of scientific research work; the further increase of the economic effectiveness of the use of computer technology at the institutes of the Academy of Sciences;

--the scientific and scientific organizational activity of the Institute: Physical and Technical Problems of Energetics during 1978-1982, (Footnote 12) (See Ch. Sipavichyus and V. Petrauskas, "The Activity of the Institute of Physical and Technical Problems of Energetics During 1978-1982," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA B, Vol 4(143), 1984, pp 147-157) the Institute of Semiconductor Physics during 1979-1983, (Footnote 13) (See Y. Samaytis and V. Petrauskas, "The Activity of the Institute of Semiconductor

Physics During 1979-1983," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA B, Vol 3(148), 1985, pp 132-139) the Institute of Biochemistry during 1978-1982, (Footnote 14) (See Y. Samaytis and V. Petrauskas, "The Activity of the Institute of Biochemistry During 1978-1982," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 3(91), 1985, pp 133-138) and the Institute of Philosophy, Sociology, and Law during 1979-1983. (Footnote 15) (See P. Dichyus, "The Activity of the Institute of Philosophy, Sociology, and Law During 1979-1983," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA A, Vol 2(91), 1985, pp 147-153)

To execute Decree No 344 of the Presidium of the Lithuanian SSR Academy of Sciences of 30 November 1983 "On the Positive Experience of Institutes, Laboratories, and Departments in the Introduction of Completed Scientific Works and the Expansion of Cooperation With Production Organizations" the information reports of the boards of directors of the Institute of Chemistry and Chemical Technology, the Institute of Physical and Technical Problems of Energetics, the Institute of Botany, the Institute of Biochemistry, the Institute of Mathematics and Cybernetics, the Institute of Semiconductor Physics, and the Institute of Physics on the activity of the institutes in this area were heard at the expanded plenary meetings of the Presidium of the Academy of Sciences.

In all 423 decrees, 52 decisions, and 174 orders were adopted.

Sessions of the General Assemblies of the Departments of Sciences and Meetings of the Bureaus of the Departments. Sessions of the general assemblies of all three departments of sciences, at which the scientific and scientific organizational activity of the institutes of the departments in 1984, the plans of scientific research for 1985, and the reports of academicians and corresponding members of the Academy of Sciences were discussed, were held.

There were seven meetings of the bureau of the Physical, Technical, and Mathematical Sciences Department. The prospects of the development of the Computer Center of the Academy of Sciences and the increase of the efficiency of the use of computer technology at institutes of the biological and social science type, the organization of an interdepartmental laboratory for the recording of the pollution of the air basin of the republic, the training of highly skilled scientists, and other questions were discussed.

There were 12 meetings of the bureau of the Chemical, Technological, and Biological Sciences Department. The specialization of the subdivisions of the Institute of Zoology and Parasitology, the Institute of Biochemistry, and the Institute of Botany, the strengthening of the contacts with production organizations and the establishment of scientific production complexes and associations--the Galvanotekhnika and Rybovodstvo Scientific Production Associations, the coordination of the research being conducted at preserves and other protected territories of the Lithuanian SSR, the preparation of a new edition of "Krasnaya kniga Litovskoy SSR" [The Red Book of the Lithuanian SSR], suggestions on the intensification of fish breeding by using the heated waters of the Ignalinskaya Nuclear Electric Power Plant, the increase of the productivity of soils and the broadening of the research on questions of soil erosion, and other questions were discussed.

There were 23 meetings of the bureau of the Social Sciences Department. The organization of scientific research on questions of Soviet building and socialist democracy in light of the decisions of the April (1984) CPSU Central Committee Plenum, the intensification of propaganda and counterpropaganda, the intensification of scientific research in the area of the history of science and technology in Lithuania, the stimulation of the study of urgent economic problems, the development of basic research in cooperation with scientific institutions of the USSR Academy of Sciences, production organizations, and higher educational institutions, and other questions were discussed.

On 5-7 March 1984 the All-Union Seminar-Conference on Questions of Increasing the Efficiency of the Introduction of the Results of Scientific Research (On the Basis of the Example of the Activity of the Institute of Chemistry and Chemical Technology of the Lithuanian SSR Academy of Sciences) was held in Vilnius. (Footnote 16) (See on the seminar: N. Kharitonova, Y. Samaytis, and V. Petrauskas, "Increase the Efficiency of the Introduction of the Results of the Scientific Research of Academic Institutes," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 1(89), 1985, pp 134-141. Also see A. Ramanauskas, V. Petrauskas, and V. Redaytis, "The Strengthening of the Contacts of the Lithuanian SSR Academy of Sciences With Production and the Speeding Up of the Introduction of the Results of the Scientific Research of Its Institutes in Practice," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 2(86), 1984, pp 111-126; A. Ramanauskas and V. Petrauskas, "The Experience of the Institute of Chemistry and Chemical Technology in the Introduction in Production of the Results of Scientific Research," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA B, Vol 2(141), 1985, pp 93-100) The seminar was convened by the Council for the Coordination of the Scientific Activity of the Academies of Sciences of the Union Republics attached to the Presidium of the USSR Academy of Sciences, the Presidium of the Lithuanian SSR Academy of Sciences, and the Central Committee of the Education, Higher School, and Scientific Institutions Workers Union. Vice presidents, chief scientific secretaries of the presidiums, and academician secretaries of the departments of the academies of sciences of the union republics, representatives of the Council for Coordination of the USSR Academy of Sciences, as well as representatives of the Central Committee of the Education, Higher School, and Scientific Institutions Workers Union and chairmen of the republic trade union committees took part in its work.

Reports were given at the seminar by Academician Yu. Matulis ("On the Forms of Cooperation of Academic Institutes With Production in the Lithuanian SSR) and Director of the Institute of Chemistry and Chemical Technology Academician R. Vishomirskis ("On the Experience of the Organization of the Introduction of Completed Developments of the Institute of Chemistry and Chemical Technology of the Lithuanian SSR Academy of Sciences").

Vice President of the USSR Academy of Sciences Academician V. Kotelnikov, who supervised the seminary, presented to the collective of the Institute of Chemistry and Chemical Technology as the winner in the 1983 all-union socialist competition in the natural and technical sciences the Challenge Red Banner of the CPSU Central Committee, the USSR Council of Ministers, the All-Union Central Council of Trade Unions, and the All-Union Komsomol Central Committee.

The seminar endorsed the activity of the Institute of Chemistry and Chemical Technology and recommended its experience for dissemination. (Footnote 17) (The reports of Yu. Matulis (pp 30-34) and R. Vishomirskis (pp 34-41) at the seminar were paraphrased, the progress of the seminar and the discussions were described (pp 29-30, 41-47), and the decree of the seminar was paraphrased (p 47) in the organ of the Presidium of the USSR Academy of Sciences in No 9 of 1984 of the journal VESTNIK AKADEMII NAUK SSSR (pp 29-47) in the publication "The Increase of the Efficiency of the Use of the Results of Scientific Research. The Seminar-Conference in Vilnius")

On 7 March First Secretary of the Lithuanian CP Central Committee P. Grishkyavichyus met with Vice President of the USSR Academy of Sciences Academician V. Kotelnikov. During the conversation Academician V. Kotelnikov noted that the achievements of the institutes of the Lithuanian SSR Academy of Sciences in the matter of introducing the results of scientific research in practice are valued in the country and that they, in solving several important problems, have become the leading ones in the country. (Footnote 18) (See "The Meeting in the Lithuanian CP Central Committee," SOVETSKAYA LITVA, No 60(12373), 8 March 1984, p 1)

On 29 May 1984 V.A. Medvedev, chief of the Science and Educational Institutions Department of the CPSU Central Committee, visited the Academy of Sciences. He familiarized himself with the House of Scientists and the activity of the Institute of Semiconductor Physics and met with members of the Presidium of the Academy of Sciences and directors of the institutes of the Academy of Sciences. Secretary of the Lithuanian CP Central Committee L. Shepetis, Deputy Chairman of the Lithuanian SSR Council of Ministers A. Chesnavichyus, and Chief of the Science and Educational Institutions Department V. Baltrunas participated in the meeting.

On 25-27 June 1984 Academician A.M. Prokhorov, a member of the Presidium of the USSR Academy of Sciences and academician secretary of the General Physics and Astronomy Department, visited the Academy of Sciences. He participated in the extraordinary session of the General Assembly of the Lithuanian SSR Academy of Sciences and spoke at it, (Footnote 19) (See the source indicated in Footnote 9) and familiarized himself with the activity of the Institute of Semiconductor Physics and the Institute of Physics.

The basic directions of the scientific research of the Academy of Sciences (Footnote 20) (See the complete wordings of the basis directions of the scientific research of the Academy of Sciences: M. Rimkyavichene, "The Activity of the Lithuanian SSR Academy of Sciences in 1976," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 3(83), 1978, pp 110-112. Also see the sources (for the Institute of Economics and the Institute of Botany) which are indicated in Footnotes 10 and 11) in 1984 were the following:

1. Probability theory and its application for management problems (the Institute of Mathematics and Cybernetics),
2. The automation of scientific research (the Institute of Mathematics and Cybernetics),
3. The basic questions of theoretical and mathematical physics (the Institute of Physics),
4. Theoretical and experimental spectroscopy (the Institute of Physics),

5. Atmospheric physics (the Institute of Physics), 6. Semiconductor physics and chemistry (the Institute of Semiconductor Physics), 7. The development of instruments and equipment (the Institute of Semiconductor Physics), 8. The physical and technical problems of energetics (the Institute of Physical and Technical Problems of Energetics);

9. The physical chemical problems of electroplating (the Institute of Chemistry and Chemical Technology), 10. The biochemical and genetic principles of the functioning of the cell and the directed synthesis of cytoactive compounds (the Institute of Biochemistry), 11. The laws of the functioning and productivity of the species and phytocenoses and their efficient use for the improvement of the fodder base (the Institute of Botany), 12. Hereditary information and the physiological biochemical principles of its implementation in plant growing and biotechnology (the Institute of Botany), 13. The laws of the functioning and productivity of the species and zoocenoses and their efficient use (the Institute of Zoology and Parasitology), 14. The biological principles of the increase of the productivity and the efficient use of inland bodies of water (the Institute of Zoology and Parasitology), 15. Contemporary physical geographical processes and the scientific principles of the formation, efficient use, protection, and forecasting of the development of the natural environment of the Baltic Sea and the territory of the Lithuanian SSR (the Geography Department of the Institute of Zoology and Parasitology);

16. Theoretical questions of expanded socialist reproduction, the increase of the efficiency of social production, the improvement of its management, and forecasting (the Institute of Economics), 17. The interaction of developed socialist society and the individual under the conditions of the present scientific and technical revolution (the Institute of Philosophy, Sociology, and Law), 18. The laws of the historical development of the Lithuanian people (the Institute of History), 19. The laws of the development and functioning of the Lithuanian language, literature, and folklore (the Institute of the Lithuanian Language and Literature).

The Material and Technical Base (see Tables 2 and 4). In 1984 the total expenditures of the Academy of Sciences came to 21 million rubles, including 6.4 million rubles—wages, 6.4 million rubles—scientific research work, and 3.5 million rubles—the purchase of apparatus and equipment. The income from economic contractual operations came to 10 million rubles, the expenditures came to 8.5 million rubles.

The capital investments came to 4.97 million rubles, of them 1.6 million rubles were construction and installation work. In 1984 there were put into operation: the Laboratory Building of the Institute of Mathematics and Cybernetics (4,720 square meters of working space), the Station for the Study of Pollution of the Sea and Atmosphere in the settlement of Preyli of the Institute of Physics (140 square meters), the Dining Room of the Institute of Physics (60 seats), and the Warehouse of the Academy of Sciences (460 square meters), the construction of the Pilot Industrial Base for the Production of Antileukemia Compounds of the Institute of Biochemistry, the Republic Nursery of Laboratory Animals of the Institute of Biochemistry, and the Laboratory of

the Heat Transfer and Hydrodynamics of Nuclear Reactors of the Institute of Physical and Technical Problems of Energetics was begun.

Table 2

The Basic Indicators of the Activity of the Lithuanian SSR
Academy of Sciences During 1982-1984

Indicator	1982	1983	1984
1. Comprehensive programs fulfilled (total).....	44	39	40
1.1. All-union.....	22	22	23
1.2. Republic.....	15	10	10
1.3. Interdepartmental.....	7	7	7
1.4. Programs supervised by institutes of the Academy of Sciences.....	13	11	11
2. Themes fulfilled (total).....	572	608	637
2.1. Basic.....	176	195	200
2.2. Scientific and technical (total).....	396	413	437
2.2.1. Budget-carried.....	141	142	148
2.2.2. Economic contractual.....	255	271	289
3. Study of themes completed (total).....	268	300	290
3.1. Basic.....	78	88	81
3.2. Scientific and technical (total).....	190	212	209
3.2.1. Budget-carried.....	49	56	32
3.2.2. Economic contractual.....	141	156	177
4. Total (accumulated over 5 years) economic impact from the introduction of the results of research (thousands of rubles).....	34600	40793	41800
5. Contracts on creative cooperation fulfilled (on 31 December).....	337	325	368
6.1. Publications issued.....	173	173	164
6.2. Their size (publisher's signatures).....	1919	1794	1777
7.1. Applications for inventions submitted.....	165	144	150
7.2. Positive decisions received.....	82	91	79
7.3. Inventor's certificates received.....	101	87	109
8. Conferences and meetings organized (total).....	13	11	11
8.1. All-union.....	7	3	8
9. Expeditionary outings organized.....	89	155	90
10.1. Public lectures given.....	3679	4279	3525
10.2. Popular science articles published.....	810	947	771
10.3. "Days of Science" organized.....	27	13	10
11.1. Foreign specialists who came.....	154	152	118
11.2. Number of foreign business trips.....	106	94	99
12. Number of laboratories (departments) (on 31 December).....	156	159	159
13. Total number of workers (on 31 December).....	4765	4866	4956
13.1. Scientists (total).....	1805	1811	1855
13.2. Doctors of sciences.....	87	95	107
13.3. Candidates of scientists.....	878	897	924

[Table continued on following page]

Table 2 (continued)

Indicator	1982	1983	1984
14. Number of graduate students (on 31 December) (total)..<	245	245	253
14.1. Resident.....	103	99	107
14.2. In special-purpose graduate studies of scientific centers of the country.....	29	17	17
14.3. Graduate students admitted (total).....	71	67	65
14.3.1. Resident.....	35	26	25
14.3.2. To special-purpose graduate studies at scientific centers of the country.....	12	5	4
14.4. Graduate students graduated (total).....	62	59	70
14.4.1. Resident.....	29	27	32
14.4.2. From special-purpose graduate studies at scientific centers of the country.....	11	5	4
15.1. Doctoral dissertations defended.....	8	7	9
15.2. Candidate dissertations defended.....	50	68	58
16. Capital investments (total) (thousands of rubles).....	2943	933	4973
16.1. Construction and installation work.....	1153	492	1606
16.2. Placement of fixed capital into operation.....	2350	—	5454
17. Total expenditures (thousands of rubles).....	19774	20471	22096
17.1. Wages (Item 1).....	8094	8011	8185
17.2. Scientific research work (Item 5).....	5463	6344	6410
17.3. Purchase of apparatus and equipment (Item 12).....	3112	3198	4150
18.1. Revenues from economic contracts (thousands of rubles).....	8245	9918	10833
18.2. Expenditures on economic contracts (thousands of rubles).....	7897	8107	8890

In 1984, 11 organizations made up the pilot production base of the Academy of Sciences: the Experimental Plant of Assemblies of Computerized Instruments and Software and the Department of Experimental Production (the Institute of Mathematics and Cybernetics), the Pilot Plant of Laser and Electronic Equipment and the Experimental Works (the Institute of Physics), the Pilot Plant and the Experimental Works (the Institute of Semiconductor Physics), the Experimental Works (the Institute of Physical and Technical Problems of Energetics), the Pilot Experimental Base (the Institute of Chemistry and Chemical Technology), the Experimental Production Section (the Institute of Biochemistry), the Experimental Base (the Institute of Botany), and the Experimental Base (the Institute of Zoology and Parasitology). In all 900 people worked at them. The total amount of work and services, which were performed by these organizations in 1984, came to 2.8 million rubles.

The Coordination of Basic Scientific Research. The Republic Council for the Coordination of Scientific Activity in the Natural and Social Sciences attached to the Presidium of the Academy of Sciences supervised 28 problem scientific councils, of which more than 650 of the most prominent scientists and specialists of the republic, among whom there are more than 150 doctors of sciences, were members.

The study of more than 660 themes with respect to 46 problems was envisaged in the approved consolidated plan of scientific research for 1984. The Academy of Sciences fulfilled about 320 themes, the Ministry of Higher and Secondary Specialized Education--330, other ministries and departments--70. About 300 themes represent scientific and technical research and more than 360 themes represent basic research. In 1984 the proportion of basic research in the themes of sectorial scientific research institutes increased.

The Fulfillment of Comprehensive Programs. In 1984, 10 institutes of the Academy of Sciences (except for the Institute of History and the Institute of the Lithuanian Language and Literature) fulfilled 40 comprehensive programs (studied 137 themes), including 23 all-union programs (65 themes) and 10 republic programs (39 themes). The institutes of the Academy of Sciences supervised the fulfillment of 11 programs (4 republic and 7 interdepartmental programs). The largest number of themes, which were included in the programs, were fulfilled by: the Institute of Physical and Technical Problems of Energetics--31, the Institute of Zoology and Parasitology--22, the Institute of Physics--21, the Institute of Semiconductor Physics--19, and the Institute of Biochemistry--18. The largest number of themes of all, which were included in the programs, were accomplished by the Institute of Biochemistry--90 percent (of the total number of themes being worked on), the Institute of Physical and Technical Problems of Energetics--79.5 percent, the Institute of Zoology and Parasitology--78 percent, the Institute of Semiconductor Physics--70 percent, and the Institute of Physics--50 percent.

The Basic Results of the Scientific Activity of the Academy of Sciences. In 1984 the institutes of the Academy of Sciences elaborated 637 themes (200 basic themes and 437 scientific and technical themes, of them 289 were economic contractual themes). The elaboration of 290 themes (81 basic themes and 209 scientific and technical themes, of them 177 were economic contractual themes) was completed (see Tables 2 and 3).

Further the most important results of the scientific research, which was performed by the institutes of the Academy of Sciences in 1984, are briefly cited.

The Institute of Mathematics and Cybernetics (IMK)

The central limit theorem for random walk in a random medium on the condition that the walk is a martingale, was proven.

The criterion of the weak convergence of probability measures, which correspond to random processes with values in domains with piecewise smooth boundaries, was found; the criterion was applied to approximations of random processes in the theory of loaded open networks of queuing systems.

A metric method was developed and new estimates were obtained in limit theorems for dependent random variables in finite-dimensional and infinite-dimensional spaces.

A method of constructing and studying difference circuits for nonlinear differential equations with a nonlocal (integral) condition, which are

encountered in vibration engineering and microelectronics, was developed. By means of a computer experiment the effect of the localization of a diffusing substance in a solid was studied and the possibility of using this effect in integrated circuit engineering was indicated.

Table 3

The Number of Scientific Themes Which Were Studied and Completed by
Institutes of the Lithuanian SSR Academy of Sciences in 1984

Institute	Themes studied				Study of themes completed			
			scientific and technical				scientific and technical	
	total	basic	budg- et- car- ried	eco- nom- ic con- trac- tual	total	basic	budg- et- car- ried	eco- nom- ic con- trac- tual
Institute of Mathema- tics and Cybernetics	50	15	12	23	19	1	3	15
Institute of Physics	70	22	24	24	8	1	2	5
Institute of Semi- conductor Physics...	74	16	13	45	34	7	2	25
Institute of Physical and Technical Prob- lems of Energetics..	102	19	21	62	41	4	6	31
Institute of Chemis- try and Chemical Technology.....	144	30	31	83	103	37	8	58
Institute of Bio- chemistry.....	25	9	12	4	6	3	-	3
Institute of Botany.	38	6	8	24	26	2	-	24
Institute of Zoology and Parasitology (with Geography Department).....	36	10	15	11	16	3	5	8
Institute of Economics	29	16	9	4	11	3	4	4
Institute of Philoso- phy, Sociology, and Law (with Center of Scientific Information on the Social Sciences)	21	15	3	3	4	2	2	-
Institute of History	28	22	-	6	15	11	-	4
Institute of the Lithuanian Language and Literature.....	20	20	-	-	7	7	-	-
Total.....	637	200	148	289	290	81	32	177

Sets of suggestions, from which the optimum method on the average for the search for the global minimum of continuous functions, as well as a method for the finding of the minimum of unimodal functions, which are calculated with errors, directly follow, were developed. An improved version of the portable package of FORTRAN programs for the solution of continuous problems of optimization was developed on this basis.

The Institute of Physics (IF)

A general algebraic expression for the average energy of the radiation spectrum of an atom with any number of open shells was obtained.

A series of simple algebraic expressions for the matrix elements of energy operators in case of the basic and a number of other terms of the L- and f-shells was found. A simple formula, which describes the width of the energy spectrum of atoms and ions with one unfilled electron shell, was obtained.

A method and software for the modeling of atomic processes in thermonuclear plasma and the spectra of radiation losses of the plasma of a tokamak were developed.

The possibility of the occurrence of interparticle correlation through wave processes in a medium was predicted theoretically. It was shown that the excitations of a medium can affect much more strongly noise than the response, which creates the basis for the development of the fluctuation spectroscopy of a medium.

The generation of colliding femtosecond light pulses in case of the synchronization of their modes with allowance made for the dispersion of the phase response of a medium was studied theoretically.

A nonlinear addition to the index of refraction of a number of laser active media, which contain neodymium, was measured experimentally.

A method for the simultaneous determination of the metallicity and carbon nature of low-temperature stars on the basis of their photometric data in accordance with the Vilnius Seven-Color System was developed.

A technological process of the laser perforation of pipes was developed and industrial tests were conducted.

A method of determining the penetration of ozone from the stratosphere into the surface layer of the atmosphere by the measurement of the complex of cosmogenic and artificial radionuclides was developed.

The space-time distribution of chemical impurities over the Baltic Sea was determined. A mockup of an instrument for the measurement of the dispersion of submicron aerosol was developed and tested.

The Institute of Semiconductor Physics (IFP)

The brightening of a specimen in the vicinity of cyclotron resonance in strong electromagnetic fields was predicted theoretically.

It was predicted that the lag of the warming up of electrons under the conditions of collision ionization can lead to the occurrence of negative dynamic conduction starting with frequencies on the order of 100 gigahertz.

A new orientation of a gallium arsenide crystal with the highest speed of the propagation of surface acoustic waves of the Rayleigh type and the largest values of the constant of electromechanical coupling was detected.

A method for studying the dynamics of the electric conduction of semiconductors with a time resolution of 50 picoseconds on exposure to picosecond electron beams, light pulses, and constant and microwave electric fields was developed.

Quick-response semiconductor sensors of pulsed pressure were developed.

The Institute of Physical and Technical Problems of Energetics (IFTPE)

The average convective heat transfer and the pressure loss of bundles made of ribbed pipes, including bimetallic pipes, were studied over a broad interval of operating and design parameters in a cross flow of a liquid ($Re=2 \times 10^3-3 \times 10^5$, $Pr=0.7-4.4 \times 10^3$, $h/d=0.7-0.33$).

The empirical coefficients of a mathematical model of the mixing of water in Lake Drukshyay—the cooler of the Ignalinskaya Nuclear Electric Power Plant—were determined and the forecast of its thermal conditions was made more precise.

A new criterion of crack resistance was proposed for refractories of different structure. The possibility of forecasting the level of crack resistance of refractories according to the type of their structure was shown. An original method of determining the heat resistance of a broad class of refractories, which consists in the use of bending load with a reserve of elastic energy, was developed. Equipment was developed for the implementation of the method.

A technology of obtaining removable polymer films was developed. The film has the adhesive strength which is necessary for the protection of power equipment against corrosive substances and radioactive contamination.

A new method of numerical differentiation for the processing of experimental data and algorithms of the identification of parabolic and hyperbolic distributed systems were developed. The properties of models of autoregression fields were studied and algorithms of the evaluation of the parameters in accordance with noise-free observations of the ultimate volume were developed.

The Institute of Chemistry and Chemical Technology (IKhKhT)

The principles of the calculation of the "current density-time" dependence for potentiostatic switching and the linear sweep of the potential in systems of labile complexes were developed. It was shown that the effect of the redistribution of complex particles in a diffusive layer leads to significant deviations from analogous characteristics of complex systems, with the exception of reversible processes in systems with large excesses of ligands.

It was shown that cation additives--stimulants of the coprecipitation of ceramic micropowders and nickel--interact with the cathode and increase the nickel overvoltage, as a result of which the fractional share of the hydrogen being liberated increases and the alkalization of the catholyte layer occurs. A direct dependence between inhibition and the number of nitrogen atoms in a molecular of the additive was established.

A correlation between the nature of a carbonyl compound and its luster-forming action was detected.

The basic laws of the electrolytic precipitation of zinc and cadmium from cyanide solutions were established.

The existence of a correlation between the overall speed of the dissolution of monocrystalline zinc and the acidity of the layer near the surface of a solution of hexavalent chrome, which is determined by its anionic composition, was established for the first time.

A new convenient method of synthesizing N-heterocyclic amidoacetals was developed.

The Institute of Biochemistry (IBKh)

By the method of the immunochemical interaction of tagged ^{125}I antibodies with antigen material it was shown for the first time that transcortin (corticosteroid, a binding globulin) is synthesized on the membrane-connected polyribosomes of the liver of rats.

The capacity of Fc receptors of the lymphocytes of the blood of cattle to bind the homologous immunoglobulins IgG_1 and IgG_2 was established. The binding capacity of Fc receptors of normal and leukemic lymphocytes is different. It was established that the content of circulating immune complexes in the blood serum of cattle ill with leukosis at an advanced stage of leukosis is reduced and that the immune complexes contain immunoglobulins IgG and IgM .

The kinetic laws of the oxidation-reduction reactions of a number of flavin enzymes, which contain heme and copper, were studied.

The functioning in the mitochondria of the liver of the intermembrane transfer of electrons, in which cytochrome c performs the role of the connecting link, was demonstrated.

A preparative method of the synthesis of p-fluorophenylalanine and a number of its N-acyl derivatives, which contain cytotoxic groups, were developed. The transformations of derivatives of alkylthiochloroacetic acids on exposure to bases were studied, the mechanism of these reactions was shown. Among the synthesized compounds ones which have a pronounced antitumor-antileukemia or growth-stimulating activity were found.

The Institute of Botany (IB)

The distribution, ecological and biological peculiarities, as well as the reserves of 180 types of the most important fodder, berry, medicinal, and industrial plants in the natural cenoses of southern, southeast, and eastern Lithuania were established. Diagrammatic maps of their overgrowths and cenoses were drawn up, recommendations on their efficient use were elaborated. Material was gathered from more than 1,000 sites of growths in various biotopes and cenoses.

The variability of the radial growth of trees and its connection with climatic factors, atmospheric circulation, and solar activity in a number of regions of the USSR was studied by dendroclimatological methods.

The threshold of the sensitivity of the force of gravity among plants was established for the first time on earth and under the conditions of weightlessness.

During the study of growth processes new derivatives of indolyl acetic acid in cells were extracted and established, their dependence on the peculiarities of phytohormones was established.

In all 18 new derivatives for the regulation of the growth of the haulms of barley and wheat were developed. Compounds, which stimulate the formation of tubers of potatoes and increase their yield on the average by 50 quintals per hectare, were developed.

The Institute of Zoology and Parasitology (IZP)

The law, which explains the mechanism and the nature of the structure of models of the dependence of migrations of birds on the conditions of flight, was established. The causes of reverse migrations were established and models of these migrations were developed.

When studying the regulation of the behavior of animals the connection of the intensity of the behavioral reaction of fear with a change of the biochemical processes of the brain was established.

The correlation dependence between the productivity of the bee colony and the quantity of several components of the pheromone of the queen bee was established. The substances, which decompose the pheromone of the queen bee, were ascertained and their localization was determined.

An evaluation of the entomological complex (258 species) of garden pests was made.

New data on the ecological, genetic, and immunological peculiarities of the interaction of populations of hosts and their parasites were obtained.

The dependence of genetic and allelic frequencies and the qualitative and quantitative structures of zoocenoses on the capacity of the heat zones of bodies of water and their stability was established. A qualitative heuristic model of adaptive rearrangements of water cenoses was developed (on the basis of the example of the Ignalinskaya Nuclear Electric Power Plant).

The connection between the frequencies of phenotypes in populations of river fish and the biotopic peculiarities was studied. The biologically active levels of chemical substances of anthropogenic origin, which are borne in bodies of water and affect migrating anadromous fish, were determined.

A new concept of the mechanism of the negative electrotaxis of fish was developed. An evaluation of the rhythm of the working of the heart of fish of different ecological groups in the presence of various environmental irritants was made on the basis of automated systems.

The Geography Department (OG) of the Institute of Zoology and Parasitology

Jointly with scientists of the GDR and Poland the monograph "Bio- i litostratigrafiya pozdnechetvertichnykh donnykh otlozheniy Baltiyskogo morya" [The Bio- and Lithostratigraphy of the Late Quaternary Bottom Sediments of the Baltic Sea] (in Russian), in which a sound litho- and biostratigraphic subdivision of the sedimentary layer and a regional stratigraphic diagram of the bottom sediments of the Baltic Sea were presented for the first time, was prepared.

The Institute of Economics (IE)

A long-term comprehensive program of the development of the unified transportation system of the Lithuanian SSR to 2000, which will serve for guidance in the drafting of 5-year plans of the development of transport, was elaborated.

An analysis of the efficiency of the procedure of forming and using the wage fund and the effectiveness of the use at associations and enterprises of the system of material stimulation, the efficiency of the use of economic standards, and methods of the stimulation of work on the acceleration of the introduction in production of the achievements of science and technology was made.

The first phase in the formulation of the Comprehensive Program of Scientific and Technical Progress of the Lithuanian SSR for 1991-2010 was completed.

The practice of using computers for the performance of various functions of the management of the industrial enterprise was studied and was evaluated economically.

The Institute of Philosophy, Sociology, and Law (IFSP)

During the study of the laws of the development of the social activity of workers and engineering and technical personnel of industrial enterprises the objective production technological and social conditions of social activity, the subjective factors of its appearance, and the mechanism of the systematic influencing of the convergence of workers and engineering and technical personnel were revealed. Specific recommendations on the efficient formation of the social activity of workers and engineering and technical personnel were presented. The material was generalized in the book "Pokazateli i indikatory sotsialnogo razvitiya rabochego klassa i inzhenerno-tehnicheskoy intelligentsii Litovskoy SSR" [The Indices and Indicators of the Social Development of the Working Class and Engineering and Technical Intelligentsia of the Lithuanian SSR] (1984, 380 pages), which was prepared jointly with the Institute of Sociological Research of the USSR Academy of Sciences.

The methodological principles of the use of information of budgets of time in socioeconomic planning at different levels of management—at the level of the country, the republic, and the region—were studied.

The structure and dynamics of offenses in the city of Kapsukas were studied, the social factors of offenses were identified, and the role of state and economic organs and organs of justice in the planning of preventive measures was studied.

The Institute of History (II)

Works, in which the reactionary activity of the Catholic church in the political and social life of Lithuania during the period of feudalism is analyzed, were prepared for publication.

The collection of documents "Bully rimskikh pap" [Bulls of the Popes], which reveals the role of the papacy in the organization of aggressive crusades against Lithuania in the 13th-14th centuries, was prepared for publication.

The political system in Lithuania during 1926-1940 was studied, the social policy of the fascist regime was exposed, the political struggle among bourgeois parties and groups was covered.

The Institute of the Lithuanian Language and Literature (ILYaL)

Volume 2 of "Slovar sovremennykh litovskikh familiy" [A Dictionary of Contemporary Lithuanian Surnames], in which contemporary Lithuanian surnames are presented and their prevalence, frequency, and origin are indicated, was prepared for publication.

The sections of the all-union publication "Istoriya vseмирnoy literatury. Istoriya literatur narodov SSSR dooktyabrskogo perioda" [The History of World Literature. The History of the Literatures of the Peoples of the USSR of the Pre-October Period] on Lithuanian literature of the 18th, the first and second halves of the 19th, and the early 20th centuries were prepared for publication.

The Central Library (TsB)

The holdings of the Central Library were augmented by 69,815 items and at the end of the year came to 3,445,000 items, including 2,811,835 items in the main collection.

International book exchange was conducted with 751 organizations of 40 countries, 11,268 items of foreign publications were received.

In all 627 exhibitions of new acquisitions, 31 thematic exhibitions, an exhibition of the scientific book of Bulgaria, and an exhibition of publications of Springer Verlag (West Berlin) were organized. Scientific publications of the Lithuanian SSR were exhibited at exhibitions in Poland and Bulgaria.

Two bibliographic indices (53.47 quires) were published, the publication of the two-series (alphabetical and systematic) consolidated catalog "Zarubezhnyye knigi v bibliotekakh Litovskoy SSR" [Foreign Books in the Libraries of the Lithuanian SSR] was continued.

Publishing Activity. In 1984, 164 publications (the total size of which is 1,777 publisher's signatures), including 53 issues of periodicals (566 publisher's signatures), 58 books (822 publisher's signatures), and 53 thesis, procedural, instructional, informational, and other publications (389 publisher's signatures), were published.

The institutions of the Physical, Technical, and Mathematical Sciences Department published 43 publications (370 publisher's signatures), the Chemical, Technological, and Biological Sciences Department--24 (261 publisher's signatures), the Social Sciences Department--54 (684 publisher's signatures), and institutions of the Academy of Sciences, which do not belong to departments--43 (462 publisher's signatures).

The most important books are:

--the Institute of Physics--"Lokalnyye i globalnyye primesi v atmosfere (Fizika atmosfery, No 9)" [Local and Global Contaminants in the Atmosphere (Atmospheric Physics, No 9)], "Tochnyye izmereniya v yadernoy spektroskopii" [Precise Measurements in Nuclear Spectroscopy], the Institute of Semiconductor Physics--"Elektrogradiyentnyye yavleniya v poluprovodnikakh (Elektrony v poluprovodnikakh, No 5)" [Electrogradient Phenomena in Semiconductors (Electrons in Semiconductors, No 5)] by S. Ashmontas, the Institute of Physical and Technical Problems of Energetics--"Gidrodinamika i vibratsii obtekeyemykh puchkov trub" [The Hydrodynamics and Vibrations of Streamline Tube Bundles],

--the Institute of Biochemistry--"Funktsionirovaniye genoma v ontogeneze" [The Functioning of the Genome in Ontogeny], "Tsitomorfologiya opukholey kur" [The Cytomorphology of Tumors of Chickens] by V. Kaluyna and P. Sadauskas, the Institute of Botany--"Peronosporovyye griby Pribaltiki" [Peronosporales of the Baltic Republics] by S. Stanyavichene, "Opredelitel rzhavchinnykh gribov

Litovskoy SSR" [An Index of Rust Fungi of the Lithuanian SSR] by A. Minkyavichyus, the Institute of Zoology and Parasitology—"Funktsionirovaniye populyatsii soobshchestv vodnykh zhivotnykh v vodokhranilishche-okhladitele Litovskoy GRES (Teploenergetika i okruzhayushchaya sreda, No 4)" [The Functioning of Populations of Communities of Aquatic Animals in the Reservoir-Cooler of the Litovskaya GRES (Heat Engineering and the Environment, No 4)], "Podust," the Geography Department of the Institute of Zoology and Parasitology—"Paleogeografiya i stratigrafiya chetvertichnogo perioda Pribaltiki i sopredelnykh rayonov" [The Paleogeography and Stratigraphy of the Quaternary Period of the Baltic Republics and Contiguous Regions],

--the Institute of Economics—"Ekonomicheskaya effektivnost ASU v promyshlennosti" [The Economic Efficiency of Automated Control Systems in Industry] by B. Blazhis, "Aktualnyye problemy effektivnosti kapitalnogo stroitelstva" [Urgent Problems of the Efficiency of Capital Construction], "Ekonomicheskiy mekhanizm tekhnicheskogo progressa" [The Economic Mechanism of Technical Progress] by V. Vashkyalaytis, the Institute of History—"Razvitiye politicheskoy sistemy sovetskogo obshchestva v Litve. 1961-1980" [The Development of the Political System of Soviet Society in Lithuania. 1961-1980], the Institute of Philosophy, Sociology, and Law—"Prestizh professii" [The Prestige of an Occupation] by M. Titma and M. Talyunayte, "Yazyk, myshelniye i deystvitel'nost'" [Language, Thought, and Reality] by A. Dyagutis, "Ucheniye Karla Marksa i sovremennaya ideologicheskaya borba" [The Teachings of Karl Marx and the Current Ideological Struggle], the Institute of the Lithuanian Language and Literature--Volume 13 of the academic "Slovar litovskogo yazyka" [Dictionary of the Lithuanian Language], "Grammaticheskaya sistema litovskogo yazyka" [The Grammatical System of the Lithuanian Language] by A. Valyatskene.

Expeditions. In 1984 the institutes of the Academy of Sciences organized 90 expeditionary outings, in which more than 650 people took part.

The Institute of Physics. Photographic and photoelectric observations of stars were made on Maydanak Mountain (the Uzbek SSR).

In the environs of the Ignalinskaya Nuclear Electric Power Plant the concentrations of radionuclides in the surface layer of air were measured; equipment and methods of the measurement of the concentration of short-lived radioactive inert gases were tested.

The collection of samples of the surface microlayer of water and foam and their primary processing for the subsequent measurement of the concentration of artificial radionuclides were carried out in the surf zone of the Baltic Sea.

The Institute of Physical and Technical Problems of Energetics. Observations of the dynamics of the water balance of Lake Drukshyay, as well as of the change of meteorological elements subject to the distance from the lake were made.

The Institute of Biochemistry. Studies of the leukosis of cattle were conducted at livestock farms of Kaunasskiy, Alitusskiy, Shyaul'yayskiy, Panyavezhskiy, Moletskiy, Shvyanchenskiy, and other rayons of the republic.

The Institute of Botany. Expeditions for the study of the flora and vegetation, the ecology of micromycetes, and phytoviruses, the ecological study of the landscape, the investigation of the northern part of Kurshyu-Mares Bay, the study of useful plants and green plantings in rural areas, dendroclimatological studies, and others were organized.

The Institute of Zoology and Parasitology. An expedition on the zoology of dry land, a pedobiological-parasitological expedition, an expedition on ecological studies of the region of the Ignalinskaya Nuclear Electric Power Plant, and a hydrobiological expedition were conducted.

The Geography Department. Landscape geochemical studies were conducted, the dynamics and morphology of seashores and the contamination of the water and soils of the sea were studied.

The Institute of History. The burial grounds in Kryatingskiy Rayon were studied. Material was collected on the themes: folk weaving, bee keeping in the late 19th and early 20th centuries, ancient means of grinding, the ethnodemographic development of the family of the urban population under the conditions of developed socialism.

The Institute of the Lithuanian Language and Literature. Onomastic and other linguistic material was collected in Birzhayskiy and Panyavezhskiy Rayons. In Lazdiyskiy Rayon 3,000 words were collected for "Slovar litovskogo yazyka." In Anikshchyayskiy Rayon 3,500 folklore works—1,100 songs, 900 legends, and 1,400 units of minor folklore genres—were recorded.

Scientific Conferences. In 1984 the institutes of the Academy of Sciences organized 11 scientific conferences, symposiums, and meetings, of them 8 were all-union and 3 were republic.

The Institute of Mathematics and Cybernetics. The All-Union Symposium "Current Problems of Mathematical Economics."

The Institute of Physics. The 6th All-Union Conference on the Nonresonance Interaction of Optical Radiation With Matter, which was organized jointly with the Scientific Council of the USSR Academy of Sciences for the Problem "Coherent and Nonlinear Optics," the State Institute of Optics imeni S.I. Vavilov, and the Institute of General Physics imeni P.N. Lebedev of the USSR Academy of Sciences. Specialists from 143 organizations of 42 cities took part.

The Institute of Semiconductor Physics. The Conference of Young Scientists "The Physics, Technology, and Production of Semiconductor Instruments."

The Institute of Physical and Technical Problems of Energetics. The All-Union Conference "The Directions of the Development of Energetics and the Trends of Scientific and Technical Progress in It Under the Conditions of the Northwest

of the USSR With Allowance Made for the Energy-Saving Policy." There were 72 participants.

The 6th All-Union School of Young Scientists and Specialists "Nuclear Power Engineering and the Environment." (Footnote 21) (A. Ashmantis and Y.-E. Adomaytis, "The 6th All-Union School of Young Scientists and Specialists in Problems of Neutron Reactors 'Nuclear Power Engineering and the Environment'," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA B, Vol 2(147), 1985, pp 125-126)

The Institute of Botany. The All-Union Conference "The Theory and Practice of the Use of the Immunity of Agricultural Crops to Viral Diseases."

The Institute of Zoology and Parasitology. The All-Union Conference "Problems of the Protection of the Animal World" and a plenum of the Scientific Council of the USSR Academy of Sciences for the Problem "The Biological Principles of the Assimilation, Reconstruction, and Protection of the Animal World." There were 101 participants from 35 institutions.

The Geography Department. The 2d Coordinating Conference of Directors of Geography Institutions of the USSR Academy of Sciences and the Academies of Sciences of the Union Republics and the scientific session of the Scientific Council for Problems of the Biosphere attached to the Presidium of the USSR Academy of Sciences "The Geographic Forecast: Theory, Methods, Regional Aspect." There were 46 participants.

The Institute of Economics. The Republic Conference "Problems of the Regulation of the Movement of Manpower Resources and the Population."

The Institute of History and the Institute of the Lithuanian Language and Literature. The joint conference "Urgent Ideological and Esthetic Problems of Lithuanian Soviet Art."

The Central Library. The 18th All-Union Conference "Book Collections: Questions of Acquisition and Preservation."

The Introduction of the Results of Scientific Research. (Footnote 22) (Also see the sources indicated in Footnote 16) In 1984 the elaboration of 209 scientific and technical themes was completed, of them 177 were economic contractual themes. In all 125 developments were introduced in the national economy. The total (accumulated after 5 years of introduction) economic impact is 41.8 million rubles, the primary (accumulated after the 1st year alone of introduction) economic impact is 7 million rubles (see Table 4).

Further the most important results of research, which were introduced or were being introduction in practice in 1984, are cited.

The Institute of Mathematics and Cybernetics. Programs for the solution of multiple extremum problems of designing on the ELBRUS MVK (for the purpose of the optimization of the composition of paints, the parameters of an immunological model, and computations in case of the development of devices of vibratory transfers) were introduced at nine organizations.

A package of applied programs of SORRA (System of the Online Development of the Recognition of Algorithms) for the recognition of noise-type signals, which was improved and supplemented with new modules, was introduced at the Scientific Research Institute of Means of Automation (Minsk).

Jointly with the Institute of Semiconductor Physics algorithms and programs of the optimization of thin-film internal coatings of cathode-ray instruments, which will make it possible to improve the quality of picture tubes, were introduced at the Ekranas Plant (Panyavezhis), while a mathematical model of the optimization of integrated circuits was developed for the Nuklon Plant (Shyauliyay).

The Institute of Physics. Highly automated programs for the numerical solution of Hartree-Fock equations with additional conditions and the calculation of the energy spectra of atoms and ions were introduced at Kharkov State University.

A logarithmic spectrometer for the continuous periodic measurement and recording of the aerosol state of the atmosphere was introduced in practice.

A method of acting on cumuliiform clouds for the purpose of preventing hail was introduced in the Moldavian SSR.

Laser equipment and the process of the laser thermal hardening of drills was introduced at the Vilnyus Furniture Combine.

The Institute of Semiconductor Physics. A completely automated unit for the local contactless determination of the mobility and concentration of current carriers and their distribution along the coordinate in a semiconductor wafer was introduced.

There were introduced: a device for the determination of the longitudinal and lateral components of the induction of the magnetic field which focuses charged particles in an accelerator; magnetically sensitive heads for the contactless determination of the quality of products of ferrous metallurgy; the Vilnyale-2 and Vilnyale-3 microcomputers at the Shyauliyay Television Plant.

The Institute of Physical and Technical Problems of Energetics. The results of the study of the conditions of heat exchange for open hearth furnaces were used at enterprises of Sverdlovsk.

The Shpat-1 spackling compound, which was developed at the institute, is being used at the Kaunas Tsentrolit Plant and the Alitus Machine Building Plant.

A package of programs for the numerical differentiation of the thermal physical quantities being measured was introduced at the Institute of Technical Thermal Physics of the Ukrainian SSR Academy of Sciences.

Equipment and methods of the monitoring of processes in the reactors of the Ignelinskaya Nuclear Electric Power Plant were introduced.

The results of the research on the optimization of the deliveries of petroleum products to enterprises of the Lithuanian SSR were introduced.

The Institute of Chemistry and Chemical Technology. The work on the introduction of the results of scientific research was completed at 20 enterprises (at 19 on an economic contractual basis and at 1 in accordance with a contract on creative cooperation).

In all 22 technological developments with introduced in production, 20 of them were protected by inventor's certificates. Technological developments, which are protected by certificates, were introduced 32 times, but the Lameda NBT's alkaline cyanide-free electrolyte, which was introduced at 8 enterprises and yielded the greatest primary annual economic impact--246,900 rubles--was introduced most often.

At the Ufa Plant of Switching Equipment 16 processes developed at the Institute of Chemistry and Chemical Technology were introduced, of them 11 were in place of technologies of foreign firms.

The greatest economic impact from 1 enterprise--1.31 million rubles--was obtained at the Ufa Plant of Switching Equipment. A primary economic impact was obtained at 18 enterprises and at the Institute of Chemistry and Chemical Technology exceeded for the first time 2 million rubles (2,107,000 rubles). An overwhelming portion of it was obtained outside the republic. In the Lithuanian SSR five processes were introduced at enterprises of Kapsukas, Shyauliyay, and Vilnius. The production relations of the institute with enterprises of the Urals, Kazakhstan, and Siberia are being broadened.

Two technological developments were introduced for the first time (moreover, significantly ahead of the deadlines). These are the technological process of weak acid lustrous galvanizing from the Lameda OT's nonfoaming electrolyte and a sulfuric acid electrolyte for the electroplating of the holes of printed circuit boards.

The Institute of Biochemistry. Laboratory models of the Enzalist-G approximate analyzer for the rapid detection of glucose in the blood and other biological fluids were developed and produced in the Experimental Production Section. The high selectivity of the analyzer is ensured by a multilayer system of membranes. The analyzer is being used in clinics, for the mass examination of the population, and in the microbiological and food industries. The technical specifications for the series production of analyzers are being prepared.

A serological method of the early diagnosis of leukosis of cattle was used at the Republic Veterinary Laboratory (the primary annual economic impact is 85,600 rubles).

The Institute of Botany. The most important introduced works are: the recommendation "Norms of Mineral Fertilizers for Sugar Beets in Case of the Application of Manure and on Various Predecessors" (a primary impact of 74,300 rubles); an installation for the cultivation of chlorella (the Shirvinta Kolkhoz); a live indicator for the monitoring of the toxicity of

fodders (the Giryale Poultry Plant); the evaluation of the properties and the certification of polymer materials for microbiological resistance and atmospheric aging under natural conditions; the Fiton-3 instrument for the conducting of experiments with plants under weightless conditions.

The Institute of Zoology and Parasitology. Recommendations on the biotechnology of the raising of producers and the use of female schools of herbivorous fish were introduced at enterprises of the Administration of the Fish Industry (the primary impact is 85,400 rubles); the results of the studies conducted by the Geography Department of the peculiarities of the dynamics and direction of the development of the coastal zone of the Kurshskiy Sand Bar on the side of the bay for the purpose of elaborating shore protection measures on the sections being eroded were introduced in Kaliningrad Oblast (the economic impact is 500,000 rubles).

The Institute of Economics. There were turned over for introduction: suggestions on the improvement of the economic evaluation of the use of computers; suggestions on the development of a unified transportation system of the Lithuanian SSR; the basic provisions of the procedural recommendations of regional forecasting (at the level of the union republic); an evaluation of the demographic situation in the Lithuanian SSR; a forecast of the basic indicators of the Lithuanian SSR national economy to 2010, and others.

The Institute of Philosophy, Sociology, and Law. The results of research: on the peculiarities of cooperation between bourgeois nationalism and Catholic clericalism, on the improvement of preventive educational work among minors, on the prospects of studies of the problems of the communist education of young people for 1986-1990, the indices and indicators of the social development of the working class and engineering and technical personnel, were turned over for introduction.

Patent and License Work. (Footnote 23) (Also see the sources indicated in Footnote 16) In 1984 the institutes of the Academy of Sciences submitted 150 applications for inventions and received 109 inventor's certificates and 79 positive decisions (see Table 4).

In all 168 efficiency proposals, of which 157 were used in practice, were submitted.

In the national economy 71 scientific, technical, and experimental design developments, which are protected by inventor's certificates, were used.

A total of 10 applications for the registration of trademarks and production prototypes were submitted, 2 trademarks were registered. Two works were patented abroad.

More than 150 inventions were displayed at republic, all-union, and international exhibitions. The electrolyte of silver-mat nickel plating (the Institute of Chemistry and Chemical Technology) was displayed at exhibits: the Leipzig Trade Fair, "Soviet Inventions" (Berlin), and "Soviet Chemistry" (Belgrade).

In all 20 competitions were held for inventors of the institutes of the Academy of Sciences. A total of 294 scientists, including 21 doctors of sciences and 184 candidates of sciences, took part in the development of inventions. In all 28 people, 12 of whom graduated from the central institute for the increase of patent skills, worked in the patent services of the Academy of Sciences. The primary organizations of the All-Union Society of Inventors and Efficiency Experts united more than 280 people.

Contracts on Creative Cooperation (see Table 5). In 1984 the institutes of the Academy of Sciences had 368 contracts on socialist scientific and technical cooperation (154 with organizations located on the territory of the Lithuanian SSR and 214 with organizations of other union republics). The ones which had the largest number of contracts were the Institute of Mathematics and Cybernetics (50), the Institute of Physical and Technical Problems of Energetics (50), the Institute of Physics (44), and the Institute of Economics (40). In all 83 contracts with production organizations were fulfilled.

Table 5

Contracts on Socialist Scientific and Technical Creative Cooperation of
Institutions of the Academy of Sciences in 1982-1984

Institute	Number of contracts		
	year		
	1982	1983	1984
Institute of Mathematics and Cybernetics.....	49	45	50
Institute of Physics.....	38	39	44
Institute of Semiconductor Physics.....	20	26	31
Institute of Physical and Technical Problems of Energetics	36	41	50
Institute of Chemistry and Chemical Technology.....	39	30	30
Institute of Biochemistry.....	15	16	17
Institute of Botany.....	64	49	36
Institute of Zoology and Parasitology.....	29	32	37
Institute of Economics.....	15	14	40
Institute of History.....	8	9	8
Institute of Sociology, Philosophy, and Law.....	19	19	20
Institute of the Lithuanian Language and Literature.....	5	5	5
Total.....	337	325	368

Especially close cooperation was carried out with the USSR Academy of Sciences (41 contracts), organizations of the Belorussian SSR (Footnote 24) (See Y. Samaytis and T. Sidorenko, "The Joint Expanded Meeting of the Presidiums of the Belorussian SSR and Lithuanian SSR Academies of Sciences (11 February 1981)," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 2(78), 1982, pp 95-99)(20), Shyauliyay (Footnote 25) (See Y. Samaytis, V. Ulyavichyus, and V. Petrauskas, "The Prospects of Comprehensive Scientific and Technical Cooperation Between the Academy of Sciences and the City of Shyauliyay," TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA V, Vol 2(86), 1984, pp 92-97) (15 contracts, 46 themes were being fulfilled, of them 37 were completed), and Vilnius State University (19).

International Scientific Relations. In all 99 staff members of the Academy of Sciences went abroad, 14 of them for the conducting of scientific research and 40 for participation in conferences. Reports were delivered abroad by: P. Bluzma (Sweden), R. Brazis (Japan), A. Vanagas (the GDR), Corresponding Member B. Grigyalenis (France), and Academician Yu. Pozhela (the United States).

Academician Yu. Pozhela at the session of the Council of the Society of Physicists of Europe, which was held in Switzerland, was elected a member of this society.

The Academy of Sciences received 118 foreign scientists.

The Institute of Mathematics and Cybernetics jointly with academic institutes of Hungary, the GDR, Romania, and the CSSR studied the problem "Probability Theory and Mathematical Statistics."

The Institute of Physics jointly with the Institute of Solid State Physics and the Institute of Nuclear Research and Nuclear Energy of the Bulgarian Academy of Sciences worked on the problems of nuclear theory.

The Institute of Physical and Technical Problems of Energetics performed joint research with the B. Kidric Institute of Nuclear Sciences (Yugoslavia) and concluded a contract on the performance of joint research with the Institute of Thermomechanics of the Czechoslovak Academy of Sciences.

The Institute of Chemistry and Chemical Technology continued joint research on the problem "The Protection of Metals Against Corrosion" with 12 organizations of Hungary, the GDR, Bulgaria, Poland, Romania, and the CSSR.

Science Popularizing Activity. The academywide organization of the Society for Knowledge on 31 December 1984 united 783 members. A total of 3,525 lectures were given for the community of the academy, 771 popular science articles were published in the republic press, 443 television and radio appearances took place. In all 36 group trips to cities and rayons of the republic were organized, of them 10 were combined Days of Science (1 such measure was implemented in the city of Panyavezhis, where 15 years ago on the initiative of the academywide organization of the Society for Knowledge Days of Sciences were organized for the first time in the republic).

Cooperation with the Shyaulay City and the Moletskiy Rayon Organizations of the Society for Knowledge was continued, cooperation with the organization of the Society for Knowledge of the city of Snechkus was begun.

Faculties of the Republic People's University continued work at the base of institutes of the Academy of Sciences: at the Institute of Mathematics and Cybernetics—the Faculty of the Application of Mathematical Methods and Computer Technology, at the Institute of Chemistry and Chemical Technology—the Faculty of Electroplating Knowledge, at the Institute of the Lithuanian Language and Literature—the Faculty of Literature.

The Correspondence Republic School of the Young Programmer continued work at the Institute of Mathematics and Cybernetics, the School of Young Biochemists—at the Institute of Biochemistry.

Many tourist groups visited the Academy of Sciences and its subdivisions.

Socialist Competition. The collective of the Academy of Sciences fulfilled and exceeded all the academywide socialist obligations. The planned scientific research work was completed by 31 December 1984, economic contractual operations in the amount of 10,845,000 rubles were performed, 150 applications for inventions were submitted, 11 doctoral and 62 candidate dissertations were submitted for defense, manuscripts of 90 scientific works were sent to the press, about 33,000 hours were worked on communist Saturdays, the total economic impact from the introduction of the results of scientific research came to 41.8 million rubles.

The Institute of Physics, the Institute of Botany, and the Institute of History were the winners of the interinstitute socialist competition.

The following subdivisions were the winners of the competition at the institutes and institutions:

--the Institute of Mathematics and Cybernetics--the Department of Optimum Solutions (the director is Academician Y. Motskus), the Institute of Physics--the Department of Optoelectronics (Academician Yu. Vishchakas), the Institute of Semiconductor Physics--the Sector of High Frequency Instabilities (V. Ryaklaytis), the Institute of Physical and Technical Problems of Energetics--the Laboratory of Physical Chemical Processes of Heat Exchange (V. Makaryavichyus),

--the Institute of Chemistry and Chemical Technology--the Laboratory of Zinc and Cadmium Plating (Yu. Shivitskis), the Institute of Biochemistry--the Laboratory of Enzyme Chemistry (Yu. Kulis), the Institute of Botany--the Laboratory of the Study of Biodegraders (A. Lugauskas), the Institute of Zoology and Parasitology--the Laboratory of Ornithology (M. Zhalakyavichyus), the Geography Department of the Institute of Zoology and Parasitology--the Laboratory of Geomorphology and Geochemistry of the Landscape (G. Paulykyavichyus),

--the Institute of Economics--the Department of Political Economy (Academician A. Burachas), the Institute of History--the Department of the History of Feudalism (M. Yuchas), the Institute of Philosophy, Sociology, and Law--the Department of Problems of the Socialist Way of Life (A. Mitrikas), the Institute of the Lithuanian Language and Literature--the Department of Dictionaries (Corresponding Member K. Ulvidas), the Central Library--the Department of Manuscripts (E. Treynene).

The creative cooperation of the Academy of Sciences with the Belorussian SSR Academy of Sciences (Footnote 26) (See the sources indicated in Footnote 24)

and the comprehensive scientific and technical cooperation with Shyauliyay (Footnote 27) (See the sources indicated in Footnote 25) were continued.

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EYE MICROSURGERY INTERBRANCH SCIENTIFIC TECHNICAL COMPLEX

Moscow PRAVDA in Russian 13 Jul 86 p 3

[Article by O. Frantsen: "'Eye Microsurgery.' Complexes of Progress"; first paragraph is PRAVDA introduction]

[Text] The Politburo of the CPSU Central Committee supported the proposal submitted by the government on the organization of the "Eye Microsurgery" Interbranch Scientific Technical Complex. The Moscow Scientific Research Institute of Eye Microsurgery of the RSFSR Ministry of Health, the pilot plant, and the affiliates of the institute in Volgograd, Kaluga, Krasnodar, Leningrad, Novosibirsk, Orenburg, Sverdlovsk, Tambov, Khabarovsk, Irkutsk, and Cheboksary will be part of it.

If we find ourselves in the depressing world of indistinct shadows, it seems, we are willing to give everything if only to see clearly again the faces of relatives and a multicolor floor carpet, a snow-white cloud in the azure sky, and simply the number of an approaching bus. When a dream comes true, this is perceived not only as a real miracle, but also as great luck.

I am in a room, in which the happy miracle has been put on stream. Newer and newer operating tables with patients appear from the opening in the wall. They slide in a file over rails past the surgeons—sitting sculptures—who have become a part of the suspended microscopes and the nurses who are bustling about nearby. A stop. The hands of the surgeon fly above the sick eye, which has been opened wide, making in it with the aid of the most fine instruments changes which are difficult to discern from the side. The table goes on farther, to another surgeon, to the next stage of the operation. While the next patient takes the place freed by it....

A conveyor? A conveyor! Live people on a conveyor?! It is necessary to overcome a serious psychological barrier in order to accept such a thing.

The automatic line for the surgical treatment of eye diseases was the result of lengthy reflections of S. Fedorov. Of course, Fedorov's great prestige, which the scientist achieved by many years of determined work and the willingness to look, if necessary, for a big fight, helped him to implement such an idea, which is complicated and frightens many people. This disturber of the peace with a provocative "crew cut" (at one time dark, but now silvery)

developed with the assistance of other enthusiasts original methods of the surgical correction of vision. And he proved, while overcoming the strong opposition of adherents to traditional methods, the advisability of the innovations. He was elected a corresponding member of the USSR Academy of Medical Sciences. The management of the large collective of the Moscow Scientific Research Institute of Eye Microsurgery, which was established in 1980 and at which today there are more than 1,000 staff members, was entrusted to him.

The conveyor of second sight operates with a full load. There is no end to the people who want to get on it. What is going on here? Have patients already been imbued with the idea of the industrialization of surgery? No, you would not say this about many people. A person, as before, wants the physicians during an operation to deal only with him. But the desire to get to the magicians here, who return sight, is very great! And without the conveyor this would be realized, clearly, not very soon—the waiting list for the institute is very impressive. In general, the patient does go, but with internal tension. He remembers, for example, the stories of motorists about how on the conveyor in a motor vehicle fairly often they insufficiently turn, drill, and weld something, or else completely forget to install a part.

The point is that the developers understood perfectly well the difference between a motor vehicle and a person! Everything here—starting with the comfortable work chairs and ending with the modern microscopes which are controlled by the voice—enables the surgeons to concentrate as much as possible on the operation and to perform it not only quickly, but also well. The most difficult stage is intended for the most experienced specialist.

Each operating table is equipped with an interlock. It does not move from the spot until the corresponding stage of the operation has been completely finished. The entire conveyor waits patiently. If, of course, it does not have to wait long, or else what kind of conveyor is this? If the delay is appreciable (and this can happen in difficult cases which require more time than usual), the table leaves the conveyor in order not to upset the overall rhythm. An experienced physician on duty deals with the patient who required special assistance.

But such a situation is improbable. For the patients are carefully examined in advanced with the most advanced equipment, including computer technology. And they immediately order an individual operation for the few "nonstandard" people who are poorly compatible with the conveyor.

Taking into account the results of the examination, the computer helps to select the optimum operating technique. Its plan is attached to the head of the operating table, so that every surgeon would know exactly how he is to work. Moreover, the computer also puts out the result of the impending intervention, that is, the maximum possible improvement of vision in each specific case. Significant deviations from it are a special case, which they carefully investigate.

If such a thing were to happen, not only are the members of the fined brigade ashamed, they also suffer materially. Moreover, it is no trouble to establish

precisely who is at fault. Each surgeon is a department of technical control for his predecessor. The brigade method and the stimulation of high-quality work force people to treat such control seriously.

"There are very few complications," relates N. Yenina, senior nurse of the surgical block. "For the most part the reason lies not in someone's mistake, but in the fact that medicine is not omnipotent. By the way, recently the last of our nurses who wore glasses took them off, having been 'rolled' on the automated line. It is also an indicator of confidence in the innovation!"

In my presence they installed in the operating room monitors which enable not only the manager of the brigade, but also each of the medical personnel present to see in color (color is very important for ophthalmic surgeons) what is happening at each stage of the operation. The shooting is carried out automatically: a video camera is attached to the microscope and looks where the surgeon is also looking.

Owing to such screens a large number of staff members of the institute are turning into clairvoyants. It is possible to observe matters in the operating room from the director's office, from the conference hall, and from other sites. In addition to the benefit for scientific and educational work (the institute teaches its methods to Soviet and foreign specialists), this also ensures additional monitoring of the actions of the surgeons.

The clever equipment (in the sense of cleverly made) and the well thought out organization of labor not only increase the possibilities of the surgeon, but also strengthen everything positive in his character, while they neutralize the weaknesses.

It turns out that the equipment here is a good friend with psychology. It is clear that the patients also gain, since the outcome of treatment is more reliable. However, it is still necessary to wait for this outcome. But how does the patient feel before this? Not one eye moves on the conveyor--the entire person, who has not even been put to sleep, with all his doubts and anxieties! Will it not turn out that they will repair the eye, but traumatize the soul?

At the institute clinic much attention is being devoted to the conditions under which the patients are. Let the people feel here as little as possible their illness, separation from home, and fear of the operation. Thus, they wait for the operation and rest after it in a room with upholstered furniture, in which it is possible to listen to music, converse, smoke, and drink tea or coffee (incidentally, free of charge--the ministry has allocated 32 kopecks for a light breakfast for the person to be operated on).

Pleasant music is also heard on the conveyor. The patient hears nothing but it, even if he tries to catch the remarks of the surgeons. The latter communicate with each other by means of earphones and small microphones near their lips. But is there of course the sight of the frightening instruments which at any moment they will put into your eye? There is not this sight! They leave open only the sick eye, and that one is completely "switched off" by the bright light. So that there is no uneasiness! Instead of it there is

the growing confidence that the invisible, but familiar physicians will do everything properly.

When good vision returns to a person, and this happens quickly, he admires bright rugs, aquamarine fish, and stained-glass windows (which, incidentally, were created jointly by the medical personnel and the patients). Nearly everyone obtains this miraculous opportunity. For in spite of the fact that now there are fivefold more patients per surgeon than before, the quality of his labor has not become worse because of this. On the contrary, there are one-tenth as many operative and postoperative complications here as there were in case of individual service.

But does not treatment in the new way cost too much? How much complex equipment, including foreign equipment which was purchased for currency, there is there....

"Treatment on an industrial basis yields such a large gain that it is less expensive than ordinary treatment even given the luxury, to which we are agreeing and will agree further for the sake of our patients," S. Fedorov argues. "Judge for yourself. In the republic 157 rubles are spent on the treatment of 1 ophthalmic patient. Here, as calculations show, even given a threefold increase of the wage for workers (we have such a dream—the people deserve a significant incentive) 1 patient will cost only 40 rubles!"

Svyatoslav Nikolayevich did not by chance snatch a figure from the future. He is aimed at the future, just as his associates are. And he clearly sees what it is necessary to do so that eye microsurgery would become even better. There are precise calculations and plans which have been worked out in detail. On the conveyor even the instruments will be presented automatically. For the present they are eliminating on it cataracts, myopia, and glaucoma, it is planned in the future to entrust to it other diseases as well. An automated conveyor for diagnosis should also appear. But the main thing is that everything new will be quickly "copied" in the unified network of institutions for the surgical correction of vision.

The plans have a realistic basis. The work of the research collective under the supervision of S. Fedorov has received a high rating of specialists and public recognition. It was made the "foundation" for the "Eye Microsurgery" Interbranch Scientific Technical Complex.

Like the other interbranch scientific technical complexes, which are now being formed in the country for rapid advancement in the main directions of scientific and technical progress, the "Eye Microsurgery" Interbranch Scientific Technical Complex is a new form of the interrelations of science and practice. The complex should become a powerful generator of ideas and at the same time their large-capacity user.

The collective of the complex has been given great rights. Thus, it can go to any ministry or department and directly settle arising issues. It can sell without middlemen to foreign firms its instruments and synthetic crystalline lenses, which are in great demand, and purchase in exchange the necessary equipment. The new system of financing enables it to recover completely the

expenditures on research and treatment, as well as to be left with a profit. It will be possible to spend a portion of this profit, which was derived owing to intensive and high-quality labor, at its own discretion for the further technical equipment of the complex and the development in it of research, for the giving of incentives for the staff members, and for the social needs of the collective.

The complex will begin to operate at full capacity in the course of 3 years. It will help to solve in the republic the problems of the treatment of the most prevalent vision disorders: cataracts, glaucoma, myopia, astigmatism, hypermetropia, and progressive myopia in adolescents. In a day the complex will perform 1,000 operations, in a year, more than 200,000. This is quite sufficient so that patients would not experience difficulties when registering for treatment. They will be able to turn to the closest of the 12 (together with Moscow) subdivisions of the interbranch scientific technical complex, having in their hands only a passport. Long trips, numerous documents, and the camping on doorsteps will not be necessary.

Here there is much that is unusual. There is a considerable amount of that which requires additional analysis after the passage of time. The fact that the collective of ophthalmologists headed by Professor S. Fedorov found itself at the focus of public sight, is not only recognition of its services, but also an enormous responsibility for it. How successfully it will cope with the tasks facing it depends on how quickly the network of such institutions will spread over the territory of the entire country. The attainment by our medicine, which for a long time now has been using the achievements of the scientific and technical revolution, of a new level—highly humane industrial treatment—in many respects also depends on this.

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CSO: 1814/235

TRAINING AND EDUCATION

EDUCATIONAL SCIENTIFIC CENTER FOR NEW SPECIALITIES

Moscow MOSKOVSKAYA PRAVDA in Russian 16 Apr 86 p 2

[Article by L. Matusovskaya under the rubric "Personnel of the Five-Year Plan": "Education Plus Science"]

[Text] The Institute of Solid State Physics of the USSR Academy of Sciences and the Moscow Institute of Steel and Alloys have established an educational scientific center, which is called upon to improve the matter of training highly skilled personnel in the most promising directions of scientific and technical progress.

The interaction of the higher educational institutions of the capital with institutes of the Academy of Sciences is becoming closer and closer. Contracts on cooperation are being concluded, the laboratories of educational and scientific institutions are outlining coordinated plans of research. But until recently there was no such center in the capital. It is unusual in a number of parameters. Here everything has been organized as a voluntary service, staff positions are not envisaged. And nevertheless the level of instruction is high and satisfies the present requirements.

It is ensured by the enlistment in instruction of leading professors, specialists of both the higher educational institution and the Institute of Solid State Physics, and other collectives of the USSR Academy of Sciences. But the main purpose of the center is to carry out the advanced training of engineers and scientific associates, who already have practical work experience. Here the basic attention is devoted not simply to new occupations, but precisely to those, in which the higher school of the country for the present is not training specialists. They are connected with the more and more extensive use at the works and in scientific research of automated systems, ultrasonic and laser equipment, and a number of advanced technologies.

But the tasks of the center are not limited to this. Here the scientists of the higher educational institution and academic institute also conduct scientific research, enlisting in it young people, undergraduates, and graduate students. It is important that these developments, as a rule, are also in new, most promising directions of scientific and technical progress and require the participation of specialists of various types.

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CSO: 1814/220

AUTOMATION AND INFORMATION POLICY

WORK OF ALL-UNION TRANSLATION CENTER ON MACHINE TRANSLATION

Leningrad LENINGRADSKAYA PRAVDA in Russian 13 Apr 86 p 2

[Interview with Doctor of Philological Sciences Professor Yu. Marchuk, director of the All-Union Center of Translations of Scientific and Technical Literature and Documents, by NOVOSTI PRESS AGENCY correspondent M. Kryuchkov under the rubric "The Horizons of Science and Technology": "Machine Translation: The Reality and Prospects"; date, place, and occasion not given; first two paragraphs are LENINGRADSKAYA PRAVDA introduction]

[Text] Today it is becoming more and more difficult even for specialists, who have a command of foreign languages, to get their bearings in the constantly increasing flows of information. Translators are coming to their aid. The computer is coming to the aid of translators.

Doctor of Philological Sciences Professor Yu. Marchuk, director of the All-Union Center of Translations of Scientific and Technical Literature and Documents, tells a NOVOSTI PRESS AGENCY correspondent how the problems of the translation and processing of information are being solved in our country.

[Answer] Our center, which is the main organization in the country for scientific and technical translations, translates in a year about 80,000 author's sheets (24 typed pages each) of scientific and technical literature. These are translations from more than 30 languages into Russian and from Russian into tens of foreign languages. About 300 editors and other specialists, who organize a continuous production process, and up to 10,000 nonstaff translators work for us.

And still the demand for translations is not yet being completely met. Precisely for this reason machine translation, which given the steady increase of the power and operating speed of computers will make it possible to speed up significantly the "output" of information, is now a new and very promising direction of the work of the center. Indeed, an experienced worker translates with a speed of 1,200-1,500 words an hour depending on his familiarity with the theme. Machine translation systems are capable already today of putting out their "product" with a speed of up to 300,000 words an hour.

For several years the center has been actively developing three machine translation systems: from English, German, and French into Russian. Of these

systems the AMPAR (Automated Machine Translation From English Into Russian)—a system which translates from English into Russian—today is the most advanced. It is already operating under commercial conditions. The machine translation systems from German and French—NERPA (German-Russian Automated Translation) and FRAP (French-Russian Automated Translation)—are at the stage of trial operation and are also ready for commercial use.

According to the calculations of scientists and specialists, machine translation is advisable when the flow of information amounts to about 1 million words a year. The high speed of translation, the enormous capacity of computers, the prospects of the input of information from magnetic tapes, the practical lack of an alternative—all this confirms that only a computer can cope with such work quickly and on a broad scale.

In recent years the development of an automatic dictionary has become another important direction in the scientific activity of our center. Such a dictionary should facilitate the work of translators and editors by the fact that the files of the texts and dictionaries, which have been entered into the computer, are called to the console by the pressing of a button and the input of one word or another. The translation equivalents, which are stored in the computer memory, are quickly put out on the display screen. An experimental English-Russian and Russian-English dictionary-translator, the basis of which is a computer, was already used during the Olympic Games in Moscow. The pilot operation of automatic dictionaries is presently being continued. In the immediate future, we hope, extensive practical use awaits them.

In speaking about the prospects of the use of computers in translation activity, two circumstances should be noted. First, the need for the improvement of the theoretical models, which are the basis for machine translation, for the increase of its quality. This, in my opinion, is one of the main tasks of linguists, mathematicians, and all specialists, who work in the field. Second, it is necessary to improve the technology.

Machine translation neither at present nor in the immediate future is conceivable as yet as an independent activity of the computer. Its active interaction with man is required. Therefore, special devices, which make it possible when processing the text to ensure this interaction most effectively, are needed.

Such computers are now being developed both in our country and abroad. In the area of linguistics we surpass the leading developments of many countries. But then in the area of computerization and mechanization we lag. There are not enough not simply computers, but computers which would work with words. This lag is now being overcome. It will be overcome even more actively in the immediate future.

In the Basic Directions of USSR Economic and Social Development for 1986-1990 and the Period to 2000 it is envisaged, in particular, to ensure an increase of the production volume of computer hardware by 2- to 2.3-fold and to increase rapidly the scale of the use of advanced high-performance computers of all classes. This, undoubtedly, will help to solve the problems which are becoming urgent in our country.

My account would be incomplete, if I did not mention the international cooperation of our center. We are actively cooperating with the countries which belong to the International Information Service for Scientific and Technical Translation: Bulgaria, Hungary, the GDR, Cuba, and other socialist states. Russian-Finnish and Finnish-Russian terminological notebooks have been published on the basis of cooperation. Recently we made a suggestion to our American colleagues to publish jointly notebooks of new terms on space. We have fruitful contacts with specialists in machine translation of the University of Grenoble in France and with the World Federation of Translators. I was recently invited to become a member of the editorial board of the American journal COMPUTERS AND TRANSLATION, to which I willingly agreed. For progress in this matter is inconceivable without extensive international cooperation.

All conversations about whether or not machine translation is possible have already become obsolete. Machine translation has become a reality of our times. It is another matter that man translates practically everything, while the computer does not. And this, in my opinion, is also not necessary. Literary men create their works at the cost of enormous nervous strain, devoting to the creative process all their forces and feelings (I am speaking, of course, about good literary people). A computer cannot do this. Therefore, people should also translate fictional works, investing in this difficult process no less spiritual efforts than the authors. So that the computer takes over from the living translator only where this is expedient.

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COMPUTERS IN ADMISSION EXAMINATIONS TO HIGHER SCHOOL

Baku BAKINSKIY RABOCHIY in Russian 5 Apr 86 p 3

[Interview with USSR First Deputy Minister of Higher and Secondary Specialized Education F.I. Peregudov, by an AZERINFORM correspondent, under the rubric "The Higher School: At a New Level": "The Computer Is a Reliable Assistant"; date, place, and occasion not given; first paragraph is BAKINSKIY RABOCHIY introduction]

[Text] Having included computers among the entrance examination commissions at higher educational institutions, it is possible to increase the objectivity of the selection of matriculants and, consequently, also the level of skills of the future specialists. As experience shows, everyone remains a winner—both the school graduates, who failed and the number of appeals from whom is reduced to nearly one-half, and the instructors, who are freed from the exhausting procedure of the rapid checking of the examinations. This was spoken about at the All-Union Applied Science Conference "The Taking of Entrance Examinations to Higher Educational Institutions With the Use of Computers (Results and Prospects)," which was held at the Azerbaijan Institute of Petroleum and Chemistry imeni M. Azizbekov. At the request of an AZERINFORM correspondent USSR First Deputy Minister of Higher and Secondary Specialized Education F.I. Peregudov comments on its results:

[Answer] "We regard as successfully completed the experiment with the use of computers at entrance examinations, which continued for 5 years," he said. "The analysis showed that the higher educational institutions, which used computers there at one examination, are now changing over entirely to a similar evaluation of the knowledge of the examinees. And whereas 2 years ago there were 67 such institutes, now there are already 103. While in 1980 there were only two such institutes in the country. And one of them is the Azerbaijan Institute of Petroleum and Chemistry imeni M. Azizbekov, which not only introduced computers at entrance examinations, but also actively participated in the improvement and modification of this system.

"The Priyem System, which was developed by the Moscow Institute of Economics Statistics, makes it possible in the shortest possible time to evaluate comprehensively the knowledge of enrollees—the number of questions on the paper can be up to 20. Incidentally, a centralized bank of assignments, from which each higher educational institution will be able to select for itself

examination questions, is now being developed. The use of computers also streamlines the procedure of taking examinations—the auditorium, desk, and paper are automatically specified, the opportunity to conduct the taking of examinations simultaneously among all school graduates is appearing. The Priyam System ensures complete objectivity at the examinations. Or then in case of the taking of examinations in several groups the demands on the school graduates are initially excessively rigid, while at the last examinations, in order to avoid a shortage, they are reduced. The computer also makes it possible to manage with a smaller number of people on the entrance commission."

[Question] "You, of course, have come across opponents of the use of computers at entrance examinations, who assert that a computer cannot detect a talented person—a future Einstein or Darwin, who had poor marks at school."

[Answer] "In order to completely eliminate such apprehensions, an interview, at which a special commission will evaluate the life experience of the enrollee, his aptitudes, and his creative element, has been introduced as of this year. It is important to combine fundamentally the interests of the individual and society. And first of all a high-quality system of selection is needed for the training of highly skilled specialists. The examinations should become a model of fairness and objectivity.

"At the same time for the present difficulties also exist in the use of computers—several higher educational institutions do not have the necessary pool of computers. But they can turn for help to the computer centers of republic ministries. In other instances inertia is in the way. But the advantages of the use of computers are obvious, and confirmation of this is the reports given at the completed conference, I believe that its results will contribute to the extensive introduction of automated methods of the taking of entrance examinations."

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PATENTS AND INVENTIONS

BRIEF

LOW-LIGHT LEVEL COLOR TV CAMERA—The innovation of our industry—the Spektr-10VSK color television camera, which does not have analogs in other countries—has truly "feline" vision. It is intended for the transmission of the picture of objects with minimum levels of lighting. As the developers asserted in conversations, moonlight is sufficient for it. Our readers, having looked at this photograph [photo not reproduced], can make out with difficulty the flowers which are standing in the vase. But the new camera "sees" splendidly.... Yes, we have more than once sighed dejectedly, when during broadcasts of well-known ballet and opera performances, performances on ice, and other mass shows the picture on the television screen has become unclear and dim. These scenes, according to the conception of the producers, needed semidarkness, and it, of course, was carried over to the television screen. Now this obstacle has been eliminated. The new camera extracts from the semidarkness a rich and bright picture. The range of use of the new camera is broad. Such units can be used without additional lighting in various sectors of the national economy—from medicine to chemistry. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Jun 86 p 4] 7807

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CONFERENCES AND EXPOSITIONS

WORLD CONGRESS OF MATHEMATICIANS TO BE HELD IN TASHKENT

Tashkent PRAVDA VOSTOKA in Russian 10 Apr 86 p 3

[Article (UZTAG): "The Congress of Mathematicians of the World in Tashkent"]

[Text] This autumn Tashkent will become the mathematics capital of world: one of the largest scientific forums—the 1st World Congress of the Bernoulli Society of Mathematical Statistics and Probability Theory—will take place here.

Not by chance was precisely the capital of Uzbekistan selected as the site of the holding of the congress: scientists of the republic have made a substantial contribution to the development of this field of knowledge.

Now more than 60 countries are already members of the Bernoulli Society, which was founded in 1975. The goal of the society is the promotion of the development of mathematical statistics and probability theory by means of scientific contacts. While in the name of the society there is tribute to the great mathematician Jacob Bernoulli (1654-1705), who laid the foundations of probability theory as a science.

Domestic science has made an outstanding contribution to the development and formation of probability theory--by the works of the great Russian mathematician P.L. Chebyshev, his students A.M. Lyapunov and A.A. Markov, and the most prominent mathematician of the present A.M. Kolmogorov.

The Soviet school of probability theory and mathematical statistics holds a leading place in the world. The "Tashkent branch" of this school, of which the outstanding mathematician V.I. Romanovskiy (1879-1954), a professor of Tashkent State University, was the founder, played a considerable role in its formation and development. Academicians of the Uzbek SSR Academy of Sciences T.A. Sarymsakov and S.I. Sirazhdinov are his students. Today a significant detachment of specialists of probability theory and mathematical statistics, whose achievements are rated highly by the scientific community, works in the republic. Their works will also be presented at the congress, which will be held from 8 to 14 September.

As was reported in the republic organizing committee for the holding of the congress, Tashkent expects hundreds of foreign scientists from all continents. More than 30 sections, which well-known specialists from many countries of the world will head, will work at the congress. Not only theoretical, but also applied directions--the application of probability statistics methods in biology and genetics, geology and geophysics, meteorology and hydrology, and other fields--will be represented. One of the sections will discuss the questions connected with the organization of statistical calculations on computers.

An exhibition of publications on probability theory and mathematical statistics of the most prominent Soviet and foreign firms will be held during the work of the congress.

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